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Crossosoma 32(1), Spring-Summer 2006 [Issued October 2006]

A SHORT FLORA OF SHORT CANYON, KERN COUNTY, CALIFORNIA

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ABSTRACT: Short Canyon lies at the eastern end of the southern Sierra Nevada within the Bureau of Land Management's Owens Peak Wilderness Area in Kern County, California. The canyon has an unusual floristic composition, and is botanically diverse, comprising elements of the southern Sierra Nevada, Great Basin, and Mojave Desert. Elevation ranges from 2400 ft at the canyon mouth to 5700 ft at the head of the canyon. There are 56 families, 182 genera, and 324 species currently documented within Short Canyon. Approximately 500 vascular plant collections were made within the study area. The primary objectives of this study were to catalogue, voucher, and create an annotated checklist of Short Canyon's vascular flora.

KEYWORDS: California, eastern Sierra Nevada, flora, floristics, Great Basin, Mojave Desert, rare plants, Short Canyon, southern Sierra Nevada

DEDICATION: I would like to dedicate this manuscript to the memory of Mary Ann Henry (May 26, 1918–August 11, 2006). Mary Ann was a self taught botanist and environmental advocate whose efforts led to the designation of Short Canyon as an Area of Critical Environmental Concern. She recognized the uniqueness of the region's flora, spending over 10 years cataloging the plants of Short Canyon before writing the first checklist (available at the Maturago Museum in Ridgecrest). Her list has been indispensable to wildflower enthusiasts who frequent the canyon. I heard so much about Mary Ann during the course of my study, and finally had the good fortune to meet her at the Maturago Museum wildflower show in April of 2006. I am grateful to Mary Ann for her work in conserving California's desert flora and for her efforts in protecting a special place like Short Canyon.

INTRODUCTION

Short Canyon is a popular destination for wildflower enthusiasts, and is located within the 74,640 acres of the Owens Peak Wilderness area, where the Mojave Desert meets the southern Sierra Nevada in Kern County, California (Fig. 1). Not just another clever name, Short Canyon literally is a short canyon covering approximately 1,200 acres and 4.5 miles from the US Highway 395 to the head of the canyon. However, in this relatively small area there is enormous botanical diversity influenced by the geography and topography of the area (Fraga 2005; Fraga 2006). The floristic elements of the Sierra Nevada, Mojave Desert and Great Basin all influence this region of southern California and provide Short Canyon with an interesting plant composition. Habitats in the canyon range from Creosote Bush Scrub at the canyon mouth

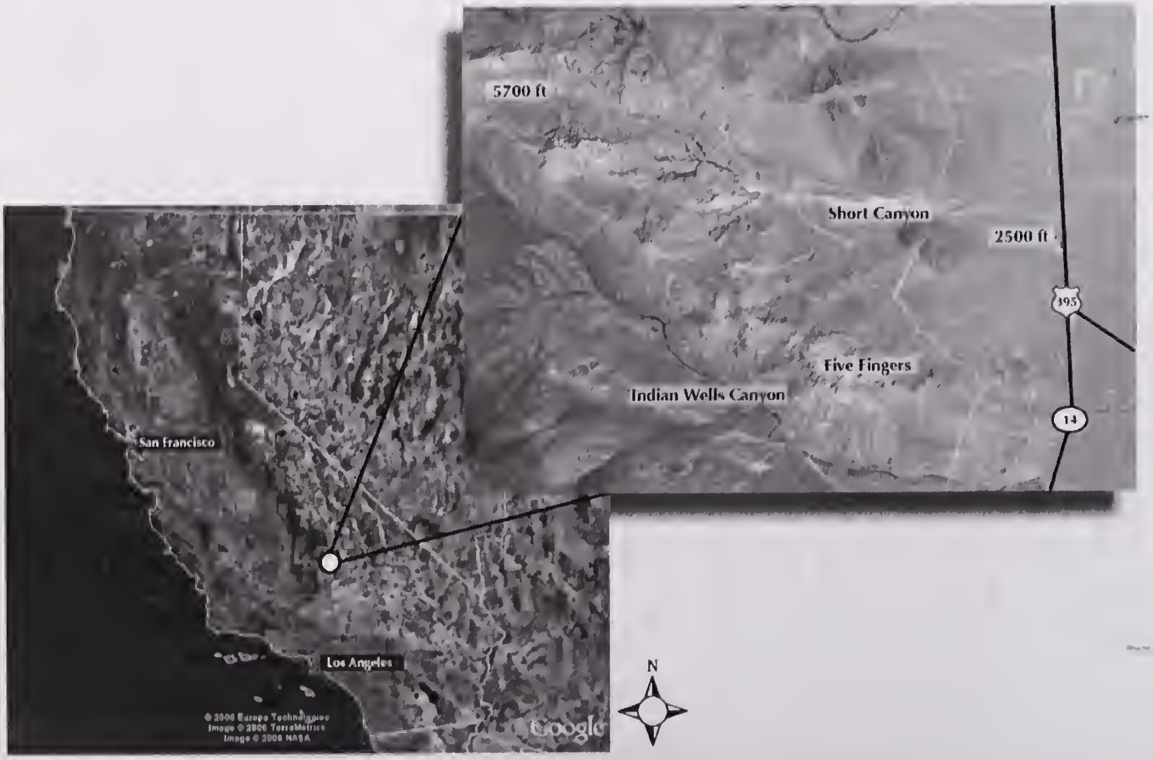

Fig. 1. A map of Short Canyon and its location in California.

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(Fig. 2) to the presence of Foothill and Pinyon Pines and at the upper reaches of the canyon. There are also several springs throughout Short Canyon providing many mesic microsites.

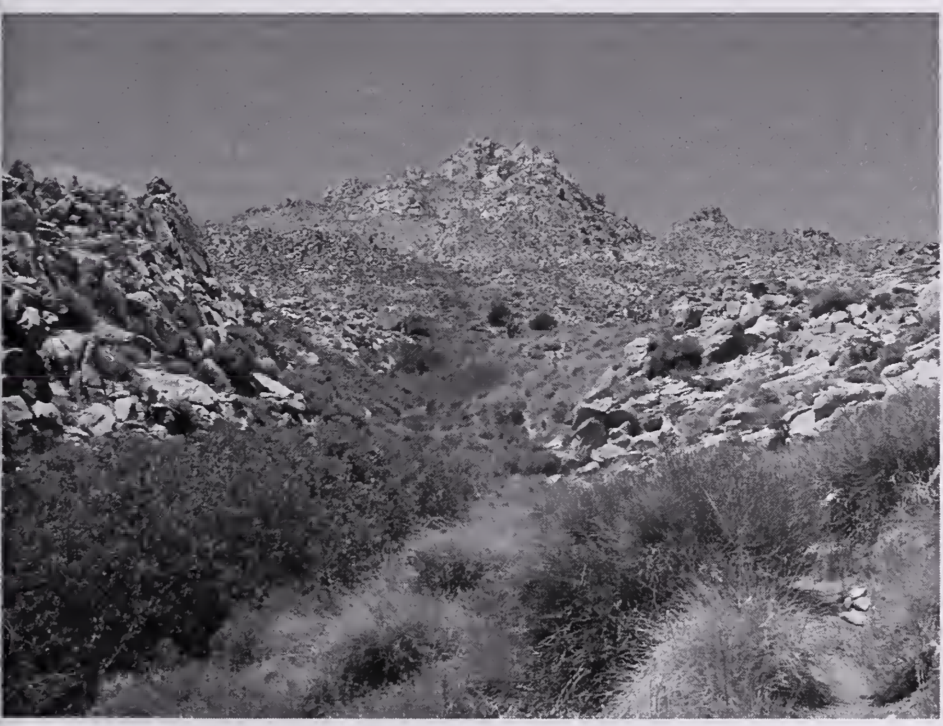

Fig. 2. Riparian area and adjacent slopes in Short Canyon.

Many local botanists are familiar with this small desert canyon in the northwestern Mojave Desert, as it is widely recognized for its spring wildflower displays. Mary Ann Henry compiled the first checklist of Short Canyon based on several years of field work she conducted from 1970-1983 (Henry 2003). Largely thanks to Mary Ann Henry's botanical work, Short Canyon was designated as an Area of Critical Environmental Concern to preserve the vegetation and diverse flora of the canyon (BLM 1996). Her checklist provides the baseline for this study.

METHODS

This project was initiated in 2002 as a senior project while I was a student at California Polytechnic University at Pomona. This small project is a component of a much larger project that constituted the larger part of my masters thesis; The Vascular Flora of the Owens Peak Eastern Watershed, southern Sierra Nevada California (Fraga 2005; Fraga 2006). Most collections were made from March to September, however collections were made in all months of the year from 2002-2005. An effort was made to collect at all possible locations, from all major physiographic features, geologic and edaphic substrates, and plant communities. All specimens were verified and annotated. Vouchers were deposited at RSA with duplicates to be sent to CAS/DS, UC/JEPS, UCR, and elsewhere. Searches of herbaria at CAS/DS, RSA-POM, and UC/JEPS were conducted in order to include historical collections as a part of the study.

Notes were taken at each collection site indicating the locality, latitude and longitude (via global positioning system receiver), elevation, substrate, aspect, habitat, associated species, and plant attributes (flower color, life form, etc.). The information was entered into the RSA-POM database from which labels were generated. Plant determinations were made using several references, including *The Jepson Desert Manual* (Baldwin et al. 2002), *The Jepson Manual: Higher Plants of California* (Hickman 1993), *A Flora of Southern California* (Munz 1974), *A Flora of Kern County, California* (Twisselmann 1967), and the RSA-POM herbarium. All nomenclature conforms to Hickman (1993) with the exception of new treatments for Cactaceae (Flora of North America, 2003), Polemoniaceae (Porter and Johnson 2000), Madiinae (Baldwin 1999), and *Ambrosia* (Strother et al. 2003). Classification of families follow the Flora of North America [FNA] (2005).

RESULTS AND DISCUSSION

This study documents 324 vascular plant taxa (including species, subspecies, varieties, and hybrids) as occurring in the study area. These include 56 families and 182 genera (sensu FNA 2005; Hickman 1993). Asteraceae is by far the largest family, accounting for 17.3% of the total flora. Important collections from Short Canyon include *Deinandra mohavensis* and *Quercus palmeri*, both collected by A. C. Sanders, S. Boyd, and V. Soza (1998). The discoveries of *D. mohavensis*, and *Q. palmeri* are significant range extensions and also new records for Kern county. Other Kern county records that have been documented since the publication of *A Flora of Kern County, California* (Twisselmann 1967) include: *Antirrhinum kingii*, *Brickellia watsonii*, *Dudleya saxosa* subsp. *aloides*, *Eriogonum ampullaceum*, *Fraxinus velutina*, *Leptochloa filiformis*, *Mentzelia obscura*, *Oenothera californica* subsp. *californica*, *Phacelia lemmonii*, *Scirpus nevadensis*, and *Solidago confinis*.

Non–native taxa account for 4% of the total flora and occur primarily near disturbed areas, and along roadsides. Several species were documented adjacent to Brady's Gas Station at the mouth of the canyon. The area has a relatively intact native flora compared with the State of California in which 17.4% of the total flora is non-native (Hickman 1993). *Encelia farinosa*, while native to California, is not native to this portion of the Mojave Desert. Plants have been planted near the roadside at the intersection of California State Route 14 and US Highway 395. Seedlings of *E. farinosa* were collected adjacent to California State Route 14; neither mature plants nor evidence of hybridization (between *E. farinosa* and the native *E. actoni*) were observed over the course of this study.

ANNOTATED CATALOG OF THE VASCULAR FLORA

The following is a list of all vascular plant taxa documented from Short Canyon. This catalog is a result of field work and search of herbaria conducted as of October 2005. Specimens that are cited can be found at RSA-POM unless designated *CAS*, *DS*, *JEPS*, or *UC*. Common, locally common, occasional, uncommon, and rare are used as an indication of the distribution of taxa across the study area. Non–native taxa are denoted by an asterisk (*); sensitive taxa are denoted by a dagger (†) ; those taxa which have been vouchered within the Owens Peak Eastern Watershed (Fraga 2006) but not in Short Canyon are denoted by a double dagger (‡). An appendix listing taxa that have not been vouchered on Mary Ann Henry's checklist follows the main list.

FERNS AND FERN ALLIES

Equisetaceae

Equisetum laevigatum **A. Braun** Perennial herb. Uncommon along sandy banks near streams. 1000-1200 m (3400-3800 ft) *Fraga & Fraga 105.*

Azollaceae

Azolla filiculoides **Lam.** Aquatic annual. Uncommon in standing water in stream channels. 1000-1200 m. (3400-3800 ft) *Fraga & Brock 1136.*

Pteridaceae

Cheilanthes covillei **Maxon** Perennial herb. Common from rock crevices and between large boulders. 1100-1500 m (3500-5500 ft) *Fraga & Denslow 182.*

Pellaea mucronata **(D. C. Eaton) D. C. Eaton var. *californica* (Lemmon) Munz & I. M. Johnston** Perennial herb. Uncommon from rock crevices and between large boulders. 1000-1200 m (3400-3800 ft) *Fraga, Anderson & Stonzenburg 1032.*

Pentagramma triangularis **(Kaulf.) Yatsk., Windam & Woolenw. subsp. *triangularis*** Perennial herb. Uncommon from rock crevices and between large boulders. 700-1200 m (2400-3800 ft) *Fraga & Anderson 1004.*

CONIFERAE

Cupressaceae

Juniperus californica **Carrière** Large shrub. Uncommon on desert and mountain slopes. 1200-1500 m (4000-5000 ft) *Fraga & Fraga 101.*

Ephedraceae

Ephedra nevadensis **S. Watson** Small shrub. Occasional on gravelly desert slopes. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 357.*

Ephedra viridis **Coville** Small shrub. Common on gravelly desert slopes, and rocky mountain slopes. 1200-1500 m (3800-5000 ft) *Fraga Boyd, Denslow & Gross 361.*

Pinaceae

Pinus monophylla **Torr. & Frém.** Tree. Occasional at the head of the canyon. 1200-1740 m (3800-5700 ft) *Fraga & Maurice 244.*

Pinus sabiniana **Douglas** Tree. Occasional on upper reaches of canyon. 1000-1740 m (3400-5700 ft) *Fraga & Fraga 130.*

ANGIOSPERMAE - DICOTYLEDONES

Apiaceae

Berula erecta **(Huds.) Coville** Perennial herb. Occasional in riparian area. 1000-1200 m (3300-3900 ft) *Fraga & Tessel 151.*

Lomatium mohavense **(J. M. Coult. & Rose) J. M. Coult. & Rose** Geophyte. Common on alluvial slopes and bajada. 850-1500 m (2800-5000 ft) *Fraga, Boyd, Denslow & Gross 327.*

Tauschia parishii **(J. M. Coult. & Rose) J. F. Macbr.** Geophyte. Occasional on alluvial slopes. 1200-1500 m (3900-5000 ft) *Fraga Boyd, Denslow & Gross 360.*

Apocynaceae

Asclepias fascicularis **Decne.** Perennial herb. Occasional near banks of riparian area. 1000-1200 m (3400-4000 ft) *Fraga & Tessel 140.*

Asteraceae

***Acamptopappus sphaerocephalus* (A. Gray) A. Gray** Small shrub. Occasional on bajada and on alluvial slopes in open desert scrub. 800-1100 m (2600-3500 ft) *Fraga & Denslow 472.*

***Ambrosia acanthicarpa* Hook.** Annual. Occasional on roadways and disturbed sites. 800-1000 m (2600-3400 ft) *Fraga & De Groot 999.*

***Ambrosia dumosa* (A. Gray) Payne** Small shrub. Common on desert slopes and bajadas. 800-1200 m (2600-3800 ft) *Fraga & Fraga 88.*

Ambrosia salsola* (Torr. & A. Gray) Strother & B.G. Baldwin var. *salsola Small shrub. Common on desert slopes and canyon floor. 850-1500 m (2800-5000 ft) *Fraga & Maurice 219.*

***Anisocoma acaulis* Torr. & A. Gray** Annual. Common on desert slopes and bajada. 1000-1500 m (3300-5000 ft) *Fraga & Fraga 523.*

***Artemisia dracunculus* L.** Suffruticose perennial. Occasional along banks above riparian area. 980-1200 m (3200-4000 ft) *Fraga, Boyd, Denslow & Gross 371.*

Artemisia ludoviciana* Nutt. subsp. *ludoviciana Perennial herb. Common along banks above riparian area. 1000-1500 m (3200-5000 ft) *Fraga, De Groot & Hobbs 991.*

Artemisia tridentata* Nutt. subsp. *tridentata Small shrub. Common on north slopes and at the head of the canyon. 1000-1500 m (3400-5000 ft) Fraga & Brock 1344.

***Baccharis salicifolius* (Ruiz & Pav.) Pers.** Large shrub. Occasional in riparian areas. 1000-1400 m (3300-4500 ft) *Fraga & Maurice 169.*

***Baccharis sergiloides* A. Gray** Small shrub. Common on banks above stream channels and desert slopes. 1000-1200 m (3300-4000 ft) *Fraga & Fraga 112.*

***Brickellia desertorum* Cov.** Small shrub. Occasional from in between large granite boulders and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, De Groot & Hobbs.*

***Brickellia watsonii* Robinson** Small shrub. Occasional in between large granite boulders and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, De Groot & Hobbs 996.*

***Chaenactis fremontii* A. Gray** Annual. Occasional in sandy bajadas and desert slopes. 800-1100 m (2600-3500 ft) *Fraga & Fraga 1110.*

***Chaenactis stevioides* Hook. & Arn.** Annual. Uncommon in sandy bajadas and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, Boyd, Denslow & Gross 323.*

***Chaenactis xantiana* A. Gray** Annual. Common in sandy bajadas, desert and exposed mountain slopes. 800-1740 m (2600-5500 ft) *Fraga & Fraga 193.*

***Chrysothamnus nauseosus* (Pall.) Britton subsp. *consimilis* (Greene) H. M. Hall & Clem.** Small shrub. Common on desert slopes and the canyon floor. 1100-1500 m (3500-5000 ft) *Fraga, Boyd, Denslow & Gross 353.*

***Chrysothamnus nauseosus* (Pall.) Britton subsp. *hololeucus* (A. Gray) H. M. Hall & Clem.** Small shrub. Common on sandy bajadas. 800-1000 m (2600-3400 ft) *Fraga & Brock 1347.*

***Chrysothamnus nauseosus* (Pall.) Britton subsp. *mohavensis* (Greene) H. M. Hall & Clem.** Small shrub. Common on desert slopes of canyons. 1200-1220 m (3500-4000 ft) *Fraga & De Groot 998.*

***Chrysothamnus teretifolius* (Durand & Hilg.) H. M. Hall** Small shrub. Occasional on desert slopes. 900-1200 m (3000-4000 ft) *Fraga, De Groot & Hobbs 985.*

***Cirsium occidentale* (Nutt.) Jeps. var. *venustum* (Greene) Jeps.** Biennial herb. Occasional on desert slopes. 900-1500 m (3000-5000 ft) *Fraga & Fraga 120.*

***Coreopsis bigelovii* (A. Gray) H. M. Hall** Annual. Common on alluvial slopes and sandy bajadas. 900-1500 m (3000-5000 ft) *Fraga & Denslow 494.*

†***Deinandra mohavensis* (D. D. Keck) B. G. Baldwin** Annual. Occasional from springs and seeps. 1150-1200 m (3800-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 954.*

***Encelia actoni* (Elmer) D. D. Keck** Small shrub. Common on desert slopes and sandy bajadas. 900-1500 m (3000-5000 ft) *Fraga & Denslow 518.*

****Encelia farinosa* Torr. & A. Gray** Small shrub. Rare; from along SR 14 between the Indian Wells Steakhouse and Brewery and Brady's Gas Station. Only seedlings collected, the source population is located along the hwy. Plants not seen naturalizing further into the study area. 800 m (2600 ft) *Fraga, Bigelow & Denslow 1017.*

Ericameria cooperi* (A. Gray) H. M. Hall subsp. *cooperi Small shrub. Common on desert slopes. 850-1200 m (2800-4000 ft) *Fraga & Denslow 483.*

***Ericameria cuneata* (A. Gray) McClatchie** Small shrub. Locally common from underneath boulders and in granite outcrops. 1000-1500 m (3300-5000 ft) *Fraga & De Groot 995.*

***Ericameria linearifolia* (DC.) Urbatsch & Wussow** Small shrub. Common on sandy canyon floors, desert slopes, and rocky mountain slopes. 1000-1500 m (3500-5000 ft) *Fraga & Fraga 90.*

Erigeron foliosus* Nutt. var. *foliosus Perennial herb. Occasional on slopes at upper reaches of canyon. 1200-1500 m (3800-5000 ft) *Fraga & Soza 893.*

***Eriophyllum ambiguum* (A. Gray) A. Gray var. *paleaceum* (Brandegee) Ferris** Annual. Common on desert slope, exposed ridgelines and canyon floors. 900-1500 m (3000-5000 ft) *Fraga, Griffith & Walker 571.*

Eriophyllum confertiflorum* (DC.) A. Gray var. *confertiflorum Suffruticose perennial. Common from granite rock outcrops and desert slopes. 900-1500 m (3000-5000 ft) *Fraga & Fraga 63.*

***Eriophyllum pringlei* A. Gray** Annual. Common on alluvial slopes and sandy canyon bottom. 900-1500 m (3000-5000 ft) *Fraga & Denslow 528.*

***Eriophyllum wallacei* (A. Gray) A. Gray** Annual. Common on alluvial slopes and sandy canyon bottom. 900-1500 m (3000-5000 ft) *Fraga & Fraga 57.*

***Filago depressa* A. Gray** Annual. Uncommon on sandy canyon bottom. 800-1200 m (2600-4000 ft) *Fraga & Denslow 452.*

‡***Gnaphalium canescens* DC.** Suffruticose perennial. Occasional in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1644.*

****Gnaphalium luteo-album* L.** Annual. Occasional on moist banks above stream channels. 1000-1400 m (3400-4600 ft) *Fraga & Tessel 152.*

***Gutierrezia microcephala* (DC.) A. Gray** Suffruticose perennial. Common on sandy canyon floor and desert slopes. 900-1300 m (3000-4200 ft) *Fraga & Brock 1322.*

***Lasthenia californica* DC. ex Lindl.** Annual. Occasional on sandy bajadas and desert slopes. 850-1000 m (2800-3300 ft) *Fraga & Denslow 458.*

***Layia glandulosa* (Hook.) Hook. & Arn.** Annual. Locally abundant on open desert slopes and canyon floor. 1100-1500 m (3500-5000 ft) *Fraga & Griffith 1087.*

***Lepidospartum squamatum* (A. Gray) A. Gray** Small shrub. Occasional on sandy bajadas and dry washes. 800-1100 m (2600-3600 ft) *Fraga & Brock 1325.*

Lessingia filaginifolia* (Hook. & Arn.) M.A. Lane var. *filaginifolia Suffruticose perennial. Occasional on canyon slopes. 975-1500 m (3200-5000 ft) *Fraga & De Groot & Hobbs 992.*

***Malacothrix glabrata* (D. C. Eaton) A. Gray** Annual. Common on bajadas, generally growing underneath shubs. 800-1500 m (2600-5000 ft) *Fraga & Fraga 194.*

***Monoptilon bellidiforme* A. Gray** Annual. Uncommon; in a dry alluvial wash with fine sandy soil. 1000 m (3400 ft) *Fraga & Denslow 527.*

***Nicolletia occidentalis* A. Gray** Perennial herb. Common on canyons floor in sandy soil and sand dunes. 800-1100 m (2600-3600 ft) *Twisselmann 4540* CAS.

***Rafinesquia neomexicana* A. Gray** Annual. Occasional from underneath shrubs serving as nurse plants in bajadas, and desert slopes. 800-900 m (2600-3000 ft) *Fraga & Denslow 463.*

***Senecio flaccidus* Less. var. *monoensis* (Greene) B. L. Turner & T. M. Barkley** Small shrub. Occasional from desert slopes and near dry stream channels. 1100-1400 m (3500-4600 ft) *Fraga, Buck, McAllister, Morgan & Virgen 957.*

***Solidago californica* Nutt.** Perennial herb. Locally abundant along moist stream channels. 1100-1220 m (3500-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 949.*

***Solidago confinis* A. Gray** Perennial herb. Locally abundant on moist banks of stream channels. 1100-1220 m (3500-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 958.*

****Sonchus oleraceus* L.** Annual. Rare in canyon drainages. 1100-1500 m (3600-5000 ft) *Fraga & Tessell 833.*

‡*Stephanomeria exigua* Nutt. subsp. *coronaria* (Greene) Gottlieb Annual. Occasional on desert slopes. 1220-1500 m (4000-5000 ft) *Fraga & Soza 891.*

***Stephanomeria pauciflora* (Nutt.) A. Nelson** Suffruticose perennial. Common on desert slopes. 800-1500 m (2600-5000 ft) *Fraga & De Groot 988.*

****Taraxacum officinale* Weber ex G. H. Wiggers** Perennial herb. Rare; on wet soil from seeps and springs. 1200 m (3900 ft) *Fraga & Griffith 1083.*

***Tetradymia axillaris* A. Nelson var. *longispina* (M. E. Jones) Strother** Small shrub. Occasional on canyons floor and desert slopes. 1100-1300 m (3600-4400 ft) *Fraga, Griffith & Walker 568.*

***Tetradymia stenolepis* E. Greene** Small shrub. Occasional on canyons floor and desert slopes. 1100-1500 m (3600-5000 ft) *Fraga, Boyd, Denslow & Gross 383.*

***Uropappus lindleyi* Nutt.** Annual. Occasional on bajadas, generally growing underneath shrubs. 900-1500 m (3000-5000 ft) *Fraga, Boyd, Denslow & Gross 338.*

‡*Xanthium strumarium* L. Annual. Rare; in riparian areas. 1100 m (3600 ft) *Fraga & Brock 1339.*

Xylorhiza tortifolia **(Torr. & A. Gray) Greene var.** *tortifolia* Suffruticose perennial. Occasional on canyon bajadas and exposed ridgetops. 800-1500 m (2600-5000 ft) *Fraga & Fraga 1100.*

Boraginaceae

Amsinckia tesselata **A. Gray var.** *tesselata.* Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 278.*

Cryptantha barbigera **(A. Gray) Greene** Annual. Occasional in bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Fraga 187.*

Cryptantha circumscissa **(Hook. & Arn.) I. M. Johnst.** Annual. Common in sandy openings of bajadas. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 348.*

Cryptantha decipiens **(M. E. Jones) A. Heller** Annual. Occasional in open sandy areas. 800-1000 m (2600-3300 ft) *Fraga & Fraga 109.*

Cryptantha intermedia **(A. Gray) Greene** Annual. Occasional in open sandy areas. 1100-1220 m (3500-4000 ft) *Fraga & Maurice 231.*

Cryptantha micrantha **(Torr.) I. M. Johnst.** Annual. Occasional in sandy open places. 800-1200 m (2600-4000 ft) *Fraga. Boyd, Denslow & Gross 347.*

‡*Cryptantha mohavensis* **(Greene) Greene** Annual. Common in open habitats on desert slopes and exposed ridgetops. 1100-1900 m (3500-6200 ft) *Fraga & Soza 759.*

Cryptantha nevadensis **A. Nelson & Kennedy** Annual. Common in sandy open places. 800-1220 m (2600-4000 ft) *Fraga & Denslow 475.*

Cryptantha pterocarya **(Torr.) Greene var.** *pterocarya* Annual. Common in open habitats on desert slopes, canyon floor and exposed ridgetops. 800-1500 m (2600-5000 ft) *Fraga & Denslow 496.*

‡*Cryptantha utahensis* **(A. Gray) E. Greene** Annual. Rare; on canyon slopes. 1220 m (4000 ft) *Fraga, De Groot & Porter 605.*

Heliotropium curassavicum **L. subsp.** *oculatum* **(A. Heller) Thorne** Perennial herb. Occasional, from disturbed sites, and open sandy places. 800-1500 m (2600-5000 ft) *Fraga Buck, McAllister, Morgan & Virgen 959.*

Pectocarya penicillata **(Hook. & Arn.) A. DC.** Annual. Occasional from sandy open places. 800-1500 m (2600-5000 ft) *Fraga , Boyd, Denslow & Gross 328.*

‡*Pectocarya recurvata* **I. M. Johnst.** Annual. Uncommon from sandy open places. 800-1500 m (2600-5000 ft) *Fraga, Gross & Navid-Ara 1079.*

Pectocarya setosa **A. Gray** Annual. Occasional from sandy open places. 800-1220 m (2600-4000 ft) *Fraga, Boyd, Denslow & Gross 309.*

Plagiobothrys arizonicus **(A. Gray) Greene ex A. Gray** Annual. Common in open sandy habitats. 800-1500 m (2600-5000 ft) *Fraga & Denslow 456.*

Tiquilia nuttallii **(Hook.) A. T. Richardson** Annual. Uncommon on bajadas and desert slopes. 900-1200 m (2800-4000 ft) *Kefee 13740.*

Brassicaceae

Arabis inyoensis **Rollins** Perennial herb. Occasional from granite outcrops. 1160-1370 m (3800-4500 ft) *Fraga & Brock 1517.*

Arabis pulchra **M. E. Jones var.** *pulchra* Perennial herb. Common in the shade of pinyons, canyon floor, and exposed ridges. 1200-1370 m (3800-4500 ft) *Fraga & Maurice 237.*

Athysanus pusillus **(Hook.) Greene** Annual. Uncommon on wet seeps and moist sandy hummocks. 1200-1370 m (3800-4500 ft) *Fraga, Boyd, Denslow & Gross 321.*

Caulanthus cooperi **(S. Watson) Payson** Annual. Common from bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Fraga 196.*

Descurainia pinnata **(Walter) Britton subsp.** *glabra* **(Wooton & Standl.) Detling** Annual. Occasional on desert slopes. 850-1370 m (2800-4500 ft) *Fraga & Fraga 196.*

Dithyrea californica **Harvey** Annual. Occasional on slopes with fine sandy soil and dunes. 850-900 m (2800-3000 ft) *Fraga & Fraga 210.*

Draba cuneifolia **Torr. & A. Gray** Annual. Rare on moist sandy banks near springs. 1100-1200 m (3500-3800 ft) *Fraga, Boyd, Denslow & Gross 344.*

Guillenia lasiophylla **(Hook. & Arn.) E. Greene** Annual. Occasional in canyon bajadas and desert slopes. 900-1220 m (2800-4000 ft) *Fraga & Denslow 521.*

Hutchinsia procumbens **(L.) Desv.** Annual. Locally common on moist sandy hummocks. 1200-1300 m (3800-4200 ft) *Fraga & Fraga 1085.*

Lepidium fremontii **S. Watson var.** *fremontii* Small shrub. Occasional on desert slopes and bajadas. 850-1370 m (2800-4500 ft) *Fraga & Maurice 226.*

Lepidium lasiocarpum **Torr. & A. Gray** Annual. Occasional on sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 414.*

Rorippa nasturtium-aquaticum **(L.) Schinz & Thell.** Perennial herb. Locally abundant in stream channels with running water. 1300-1100 m (3500-4200 ft) *Fraga & Fraga 104.*

Thysanocarpus curvipes **Hook.** Annual. Occasional on sandy slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga & Maurice 229.*

Thysanocarpus laciniatus **Nutt. ex Torr. & A. Gray** Annual. Occasional on sandy slopes and canyon floor. 1100-1400 m (3600-4500 ft) *Fraga, Boyd, Denslow & Gross 299.*

Tropidocarpum gracile **Hook.** Annual. Occasional on desert slopes and canyon floor. 850-1500 m (2800-5000 ft) *Fraga & Maurice 227.*

Cactaceae

Cylindropuntia echinocarpa **(Engelm. & Bigel.) F. M. Knuth** Succulent shrub. Common on sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Tessel 136.*

Opuntia basilaris **Engelm. & J. Bigel.** Succulent shrub. Common on sandy bajadas, and desert slopes. 800-1370 m (2600-4500 ft) *Fraga & Denslow 511.*

Campanulaceae

Nemacladus sigmoideus **G. T. Robbins** Annual. Uncommon in alluvial wash and sand dunes. 900-1000 m (2800-3400 ft) *Fraga et al. (field trip attendees) 1099.*

Capparaceae

Isomeris arborea **Nutt.** Small shrub. Common on desert slopes and bajadas. 800-1280 m (2600-4200 ft) *Fraga & Denslow 507.*

Caryophyllaceae

‡*Arenaria macradenia* **S. Watson var.** *arcuifolia* **Maguire** Suffruticose perennial. Occasional on shaded and rocky talus slopes. 1220-1370 m (4000-4500 ft) *Fraga, Honer & Soza 749.*

Minuartia douglasii **(Torr. & A. Gray) Mattf.** Annual. Uncommon on north canyon slopes. 1220 m (4000 ft) *Fraga, Soza, Honer 738.*

Minuartia pusilla **(S. Watson) Mattf.** Annual. Locally common in moist fed by springs on coarse sand. 1100 m (3600 ft) *Fraga & Brock 1517.*

Silene verecunda **S. Wats. subsp.** *platyota* **(S. Wats.) C. L. Hitchc. & Maguire** Perennial herb. Occasional on desert slopes. 1220-1370 m (4000-4500 ft) *Fraga & Anderson 1265.*

Chenopodiaceae

Atriplex canescens **(Pursh) Nutt.** Small shrub. Common on desert slopes. 1010-1220 m (3300-4000 ft) *Fraga & Brock 1326.*

Atriplex polycarpa **(Torr.) S. Watson** Small shrub. Occasional on desert slopes. 800-1220 m (2600-4000 ft) *Fraga, Boyd, Denslow & Gross 363.*

Chenopodium californicum **(S. Watson) S. Watson** Perennial herb. Rare, in moist shaded areas. 1200 m (3900 ft) *Fraga, Griffith & Walker 573.*

Grayia spinosa **(Hook.) Moq.** Small shrub. Occasional on canyon bajadas and rocky desert slopes. Common on the exposed ridgeline of Backus Peak. 850-1500 m (2800-5000 ft) *Fraga & Denslow 464.*

Krascheninnikovia lanata **(Pursh) Gludenstaedt** Small shrub. Occasional on desert slopes. 910-1220 m (3000-4000 ft) *Fraga & Denslow 498.*

Convolvulaceae

Calystegia longipes **(S. Watson) Brummitt** Perennial herb. Occasional on desert slopes and sandy canyon floor. 1100-1220 m (3600-4000 ft) *Fraga & Fraga 1108.*

Crassulaceae

***Crassula connata* (Ruiz & Pav.) A. Berger** Annual. Uncommon on moist sandy hummocks. 1100-1300 m (3500-4100 ft) *Fraga & Maurice 236.*

***Dudleya saxosa* (M. E. Jones) Britton & Rose subsp. *aloides* (Rose) Moran** Succulent perennial herb. Occasional from near crevices of large granite boulders and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga, Griffith & Walker 565.*

Cuscutaceae

Cuscuta californica* Hook. & Arn. var. *californica Parasitic annual. Common on desert slopes, most commonly growing on *Baccharis sergiloides* and *Eriogonum fasciculatum.* 1200-1370 m (3800-4500 ft) *Fraga,Buck, McAllister, Morgan & Virgen 952.*

***Cuscuta subinclusa* Durand & Hilg.** Parasitic annual. Uncommon; from large granite boulders on *Artemisia ludoviciana.* 1200 m (3800 ft) *Fraga & Anderson 1003.*

Euphorbiaceae

***Chamaesyce albomarginata* (Torr. & A. Gray) Small** Perennial herb. Occasional in open or disturbed places. 800-1370 m (2600-4500 ft) *Fraga, Gross & Navid-Ara 1057.*

†***Chamaesyce vallis-mortae* Millsp.** Perennial herb. Locally common from sandy open places. 800-1500 m (2600-5000 ft) *Fraga & Brock 1321.*

Fabaceae

Astragalus didymocarpus* Hook. & Arn. var. *didymocarpus Annual. Occasional, growing on moist sand from seeps. 1100-1200 m (3500-3800 ft) *Fraga, Griffith & Walker 560.*

‡***Astragalus layneae* E. Greene** Perennial herb. Rare; from desert bajadas. 800-1000 m (2600-3300 ft) *Rose s.n. 3 Apr 1967 67011.*

***Astragalus lentiginosus* Hook. var. *variabilis* Barneby** Perennial herb. Occasional, on desert slopes, and bajadas. 900-1066 m (3000-3500 ft) *Fraga & Denslow 428.*

Astragalus pachypus* Greene var. *pachypus Suffruticose perennial. Uncommon from the desert slopes. 850-1200 m (2800-4000 ft) *Berry 269 UCR.*

Lotus argophyllus* (A. Gray) Greene var. *argophyllus Perennial herb. Uncommon from crevices and in between granite boulders. 1100-1520 m (3600-5000 ft) *Fraga & Tessel 145.*

***Lotus humistratus* Greene** Annual. Occasional from sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 428.*

Lotus oblongifolius* (Benth.) Greene var. *oblongifolius Perennial herb. Locally common from moist stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Tessel 145.*

‡*Lotus procumbens* **(Greene) Greene var.** *procumbens* Perennial herb. Occasional in shade of pinyon woodland and on open slopes. 1830-2200 m (6000-5000 ft) *Fraga & Anderson 1273.*

Lotus purshianus **Clem. & E. G. Clem.** Perennial herb. Occasional from banks above stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Fraga 1105.*

Lotus strigosus **(Nutt.) Greene** Annual. Common from sandy canyons, and dry slopes. 800-1370 m (2600-4500 ft) *Fraga & Denslow 509.*

Lupinus bicolor **Lindl.** Annual. Occasional from bajadas and desert slopes. 915-1370 m (3000-4500 ft) *Fraga & Maurice 225.*

Lupinus concinnus **J. G. Agardh** Annual. Common on bajadas, sand dunes and desert slopes. 915-1370 m (3000-4500 ft) *Fraga, Boyd, Denslow & Gross 320.*

Lupinus excubitus **M. E. Jones var.** *excubitus* Suffruticose perennial . Common on desert canyon slopes and rocky mountain slopes. 1100-1370 m (3600-4500 ft) *Fraga & Fraga 541.*

Psorothamnus arborescens **(A. Gray) Barneby var.** *minutiflora* **Parish (Barneby)** Small shrub. Occasional on bajadas and desert slopes. 800-1100 m (2600-3600 ft) *Fraga & Denslow 517.*

Trifolium microcephalum **Pursh** Annual. Rare; on moist bank above stream edge. 1100 m (3600 ft) *Fraga & Fraga 1104.*

Trifolium willdenovii **Spreng.** Annual. Uncommon from moist areas on banks above stream, or vernally wet from nearby springs. 1100 m (3600 ft) *Fraga, Griffith & Walker 559.*

Trifolium wormskjoldii **Lehm.** Perennial herb. Rare; from near vernally moist depression fed by spring. 1200 m (3800 ft) *Fraga & Anderson 1102.*

Fagaceae

Quercus chrysolepis **Lieb.** Tree or large shrub. Common on north slopes of canyons and rocky mountain slopes. 1100-1524 m (3500-5000 ft) *Fraga & Anderson 1007.*

Quercus palmeri **Engelm.** Large shrub. Uncommon; growing above streams and vernally moist places. 1000-1200 m (3400-3800 ft) *Sanders & Boyd 22350.*

Quercus wislizenii **A. DC.** Tree. Occasional on north slopes of canyons and on rocky mountain slopes. 1000-1500 m (3400-5000 ft) *Fraga & Maurice 242.*

Gentianaceae

Centaurium exaltatum **(Griseb.) Piper** Annual. Rare; near moist places associated with springs. 1100 m (3600 ft) *Fraga & Fraga 132.*

Centaurium venustum **(A. Gray) B. L. Rob.** Annual. Rare; near moist places associated with springs. 1200 m (4000 ft) *Luthey s.n. 14 Sep 1978 CAS.*

Geraniaceae

****Erodium cicutarium*** **(L.) L'her.** Annual. Common especially on bajadas, desert slopes, and disturbed roadsides. 800-1500 m (2600-5000 ft) *Fraga & Fraga 117.*

Hydrophyllaceae

Emmenanthe penduliflora **Benth. var.** ***penduliflora*** Annual. Occasional on desert slopes. 980-1500 m (3200-5000 ft) *Fraga, Griffith & Walker 561.*

Eucrypta chrysanthemifolia **(Benth.) Greene var.** ***bipinnatifida*** **(Torr.) Constance** Annual. Occasional on desert slopes from underneath shrubs and granite rock crevices. 980-1400 m (3200-4500 ft) *Fraga, Boyd, Denslow & Gross 287.*

Nama demissum **A. Gray var.** ***demissum*** Annual. Occasional on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 477.*

Nemophila menziesii **Hook. & Arn. var.** ***integrifolia*** Parish Annual. Occasional on desert slopes and bajadas. Usually growing from underneath shrubs. 800-1500 m (2600-5000 ft) *Fraga & Maurice 253.*

‡***Phacelia austromontana*** **J. T. Howell** Annual. Occasional from talus slopes on Owens Peak. 2100-2600 m (7000-8400 ft) *Fraga & Griffith 811.*

Phacelia bicolor **S. Watson var.** ***bicolor*** Annual. Occasional on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Kirby 1279* CAS.

Phacelia cicutaria **Greene var.** ***hispida*** **(A. Gray) J. T. Howell** Annual. Uncommon on desert slopes and from between rock crevices or in between shrubs. 1200-1500 m (3800-5000 ft) *Fraga,Griffith & Walker 563.*

Phacelia curvipes **S. Wats.** Annual. Uncommon in openings on desert slopes. 1066 m (3500 ft) *Fraga & Maurice 243.*

Phacelia distans **Benth.** Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 326.*

Phacelia fremontii **Torr.** Annual. Occasional on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Maurice 223.*

Phacelia lemmonii **A. Gray** Annual. Locally common on vernally moist areas on banks above stream, moisture often associated with springs. 1200 m (3800 ft) *Fraga, Boyd, Denslow & Gross 343.*

†***Phacelia nashiana*** **Jeps.** Annual. Occasional on sandy slopes and exposed ridelines. 915-1500 m (3000-5000 ft) *Fraga & Fraga 529.*

Phacelia ramosissima **Douglas ex Lehm. var.** ***ramosissima*** Perennial herb. Uncommon growing from rock crevices or between shrubs. 1000-1500 m (3400-5000 ft) *Fraga Tessel 149.*

Pholistoma membranaceum **(Benth.) Constance** Annual. Occasional from underneath shrubs on desert slopes. 8000-1500 m (2600-5000 ft) *Fraga & Fraga 199.*

Tricardia watsonii **S. Watson** Perennial herb. Uncommon on sandy desert slopes. 800-1220 m (2600-4000 ft) *Fraga, Boyd, Denlow & Gross 292.*

Lamiaceae

Monardella odoratissima **Benth. subsp.** *pallida* **Epling** Perennial herb. Occasional on shaded slopes in upper reaches of canyon. 1220-1500 m (4000-5000 ft) *Fraga & De Groot 925.*

Salazaria mexicana **Torr.** Small shrub. Common on bajadas and desert slopes. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 91.*

Salvia columbariae **Benth.** Annual. Common on canyon floors and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Fraga 212.*

Salvia dorrii **(Kellogg) Abrams var.** *pilosa* **(A. Gray) Strachan & Reveal** Small shrub. Occasional on desert slopes and sandy canyon floor. 1200-1400 m (3800-4500 ft) *Fraga, Boyd, Denslow & Gross 369.*

Lennoaceae

‡*Pholisma arenarium* **Hook.** Parasitic perennial herb. Rare in open places in sandy soil and along road cuts. 1100-1400 m (3500-4500 ft) *Fraga & DeGroot 841.*

Loasaceae

Mentzelia affinis **Greene** Annual. Occasional in bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 478.*

Mentzelia albicaulis **Hook.** Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Fraga 554.*

Mentzelia obscura **H. J. Thompson & Joyce Roberts** Annual. Occasional on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 429.*

Mentzelia veatchiana **Kellogg** Annual. Occasional on bajadas and desert slopes. 8000-1220 m (2600-4000 ft) *Fraga, Boyd, Denslow & Gross 288.*

Petalonyx thurberi **A. Gray subsp.** *thurberi* Small shrub. Occasional in bajadas and sandy slopes. 8000-1100 m (2600-3500 ft) *Fraga & De Groot 846.*

Lythraceae

Lythrum californicum **Torr. & A. Gray** Perennial herb. Uncommon on banks above stream channels in moist soil. 1000-1200 m (3300-3800 ft) *Fraga & Tessel 146.*

Malvaceae

Eremalche exilis **(A. Gray) E. Greene** Annual. Rare; in fine sandy soil on the canyon bajadas . 915 m (3000 ft) *Fraga & Denslow 490.*

Sphaeralcea ambigua **A. Gray var.** *ambigua* Suffruticose perennial. Common on bajadas and desert slopes. 1200-1500 m (3600-5000 ft) *Fraga, Boyd, Denslow & Gross 374.*

Nyctaginaceae

Abronia pogonantha **Heimerl** Annual. Locally common on sand dunes and sandy slopes. 800-975 m (2800-3200 ft) *Fraga & Denslow 495.*

Abronia villosa **S. Wats. var.** *villosa* Annual. Locally common on sand dunes and sandy slopes. 900-975 m (2800-3200 ft) *Fraga & Denslow 503.*

Mirabilis bigelovii **A. Gray var.** *retrorsa* **(A. A. Heller) Munz** Perennial herb. Occasional from sandy canyon floor and desert slopes. 900-1500 m (2800-5000 ft) *Fraga, DeGroot & Porter 582.*

Mirabilis californica **A. Gray** Suffruticose perennial. Occasional from sandy canyon floor and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga, Honer & Soza 734.*

Oleaceae

Fraxinus velutina **Torr.** Tree. Occasional in stream channels. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 1102.*

Onagraceae

Camissonia boothii **(Douglas) P. H. Raven subsp.** *desertorum* **(Munz) Raven** Annual. Rare; from canyon bajadas. 800 m (2600 ft) *Luthy 323 CAS.*

Camissonia campestris **(Greene) P. H. Raven subsp.** *campestris* Annual. Common on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 454.*

Camissonia claviformis **(Torr. & Frém.) P. H. Raven subsp.** *claviformis* Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 211.*

Camissonia kernensis **(Munz) P. H. Raven subsp.** *gilmanii* **(Munz) P. H. Raven** Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 184.*

†*Camissonia kernensis* **(Munz) P. H. Raven subsp.** *kernensis* Annual. Occasional on desert slopes and bajadas. 850-1500 m (2800-5000 ft) *Fraga & Fraga 301.*

Camissonia pallida **(Abrams) P. H. Raven subsp.** *pallida* Annual. Common on bajadas and desert slopes. 800-1400 m (2600-4500 ft) *Fraga & Fraga 538.*

Camissonia palmeri **(S. Watson) P. H. Raven** Annual. Common on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 469.*

Clarkia xantiana **A. Gray subsp.** *xantiana* Annual. Occasional from north facing slopes with course granitic soil. 1200-1500 m (3800-5000 ft) *Fraga & McGlaughlin 1175.*

Epilobium canum **(Greene) P. H. Raven subsp.** *canum* Suffruticose perennial. Occasional from desert slope, and near edges of stream channels. 1000-1220 m (3400-4000 ft) *Fraga, De Groot & Hobbs 993.*

Epilobium canum **(Greene) P. H. Raven subsp.** *latifolium* **(Hook.) P. H. Raven** Suffruticose perennial. Occasional from desert slopes. 1000-1500 m (3400-5000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 951.*

Epilobium ciliatum **Raf. subsp.** *ciliatum* Perennial herb. Locally common in stream channels. 1100-1300 m (3500-4200 ft) *Fraga & Tessel 150.*

Oenothera californica **S. Watson subsp.** *californica* Perennial herb. Common on sand dunes and on sandy desert slopes. 915-1220 m (3000-4000 ft) *Fraga & Denslow 500.*

Orobanchaceae

Castilleja angustifolia **(Nutt.) G. Don** Parasitic perennial herb. Common on desert slopes. 915-1500 m (3000-5000 ft) *Fraga, Boyd, Denslow & Gross 279.*

‡*Castilleja applegatei* **Fern. subsp.** *martinii* **(Abrams) T. I.Chuang & Heckard** Parasitic perennial herb. Occasional on mountain slopes. 1950-2100 m (6400-7000 ft) *Fraga & Anderson 1117.*

Castilleja linariifolia **Benth.** Parasitic perennial herb. Uncommon on desert slopes, near riparian areas. 1100-1200 m (3500-3800 ft) *Fraga & Tessel 142.*

‡*Orobanche fasciculata* **Nutt.** Parasitic perennial herb. Uncommon on desert and mountain slopes. 1220-2100 m (4000-7000 ft) *Fraga & Mills 1246.*

Papaveraceae

†*Canbya candida* **C. Parry** Annual. Uncommon on north slopes of course granite soils, in open habitats. 1200-1600 m (3800-5200 ft) *Fraga, Honer & Soza 721.*

Eschscholzia californica **Cham.** Perennial herb. Common on desert slopes. 915-1700 m (3000-5500 ft) *Fraga & Maurice 221.*

Eschscholzia glyptosperma **E. Greene** Annual. Occasional on desert slopes. 900-1300 m (2800-4000 ft) *Fraga & Fraga 213.*

Eschscholzia minutiflora **S. Watson subsp.** *covillei* **(Greene) C. Clark** Annual. Common on desert slopes and bajadas. 900-1500 m (2800-5000 ft) *Fraga & Denslow 516.*

Platystemon californicus **Benth.** Annual. Common on desert slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga, Boyd, Denslow & Gross 282.*

Polemoniaceae

Aliciella lottiae **(A. Day) J. M. Porter** Annual. Occasional on bajadas and desert slopes. 800-1200 m (2600-4000 ft) *Twisselman 7163 CAS.*

Aliciella **sp. nov.** Annual. Occasional on bajadas and desert slopes. 800-1100 m (2600-3500 ft) *Fraga & Denslow 526.*

Eriastrum densifolium **(Benth.) H. Mason subsp.** *elongatum* **(Benth.) H. Mason** Suffruticose perennial. Rare; from one historical collection in Short Canyon. *Vollmer s.n. 1 Jul 1953 DS.*

Eriastrum densifolium **(Benth.) H. Mason subsp.** *mohavense* **(Craig) H. Mason** Suffruticose perennial. Occasional on bajadas and desert slopes. 1200-1500 m (3800-5000 ft) *Fraga & Tessel 155.*

***riastrum eremicum* (Jeps.) H. Mason** Annual. Occasional in open habitats, on desert slopes. 9000-1500 m (2800-5000 ft) *Twisselman 4541 CAS.*

***riastrum pluriflorum* (A. A. Heller) H. Mason** Annual. Occasional in open habitats, especially along roadsides. 800-1220 m (2600-4000 ft) *Fraga & Soza 697.*

ilia aliquanta* A. D. Grant & V. E. Grant subsp. *aliquanta Annual. Occasional on canyon slopes and bajadas. 850-1400 m (2800-4500 ft) *Fraga & Maurice 234.*

***ilia brecciarum* M. E. Jones subsp. *neglecta* A. D. Grant & V. Grant Annual.** Common on canyon floor and desert slopes. 850-1500 m (2800-5000 ft) *Fraga & Maurice 254.*

***ilia cana* (M. E. Jones) A. A. Heller subsp. *speciosa* (Jeps.) A. D. Grant & V. E. Grant** Annual. Occasional on desert slopes. 915-1500 m (3000-5000 ft) *Fraga, Gross & Navid-Ara 1082.*

***ilia leptantha* Parish subsp. *purpusii* (Milliken) A. D. Grant & V. E. Grant** Annual. Occasional on upper desert slopes. 1500-1500 m (5000-5000 ft) *Fraga & Mills 1249.*

***ilia malior* A. G. Day & V. E. Grant** Annual. Occasional on desert slopes and bajadas. 915-1220 m (3000-4000 ft) *Fraga, Gross & Navid-Ara 1056.*

ilia ochroleuca* M. E. Jones subsp. *ochroleuca Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Denslow 465.*

***ilia sinuata* Benth.** Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Denslow 522.*

***inanthus aureus* (Nutt.) Greene** Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 537.*

***Linanthus bigelovii* (A. Gray) Greene** Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Boyd 418.*

***inanthus dichotomus* Benth.** Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 307.*

***inanthus parryae* (A. Gray) Greene** Annual. Common on desert slopes and bajadas. 800-1220 m (2600-4000 ft) *Fraga & Denslow 471.*

***oeseliastrum matthewsii* (A. Gray) Timbrook** Annual. Common on desert slopes and bajadas. 850-1220 m (2800-4000 ft) *Fraga, Griffith & Walker 570.*

Phlox gracilis (Hook.) Greene Annual. Occasional on canyon floor and desert slopes. 1500-1500 m (4800-5000 ft) *Fraga, Anderson & Stolzenburg 1053.*

Polygonaceae

***entrostegia thurberi* A. Gray ex Benth. in DC.** Annual. Occasional on desert slopes and canyon floor. 915-1500 m (3000-5000 ft) *Fraga & Denslow 489.*

horizanthe brevicornu* Torr. var. *brevicornu Annual. Occasional on bajadas and canyon slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 457.*

***horizanthe watsonii* Torr. & A. Gray** Annual. Uncommon on bajadas and canyon slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 459.*

***riogonum ampullaceum* J. T. Howell** Annual. Uncommon on desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Brock 1327.*

Eriogonum baileyi **S. Watson** Annual. Occasional on mountain slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga, De Groot & Hobbs 990.*

Eriogonum brachyanthum **Coville Annual.** Occasional on find sandy soil of canyons in open habitats. 900-1400 m (2800-4500 ft) *Fraga, De Groot & Hobbs 1000*

Eriogonum deflexum **Torr. var.** *baratum* **(Elmer) Reveal** Annual. Common on exposed mountain slopes, often growing along trails. 915-1500 m (3000-5000 ft) *Fraga & De Groot 940.*

Eriogonum fasciculatum **Benth. var.** *polifolium* **(Benth. in A. DC.) Torr. & A. Gray** Small shrub. Common on canyon floor, and slopes. 915-1500 m (3000-5000 ft) *Fraga & Fraga 119.*

Eriogonum gracillimum **S. Watson** Annual. Occasional on fine sandy soil on canyon slopes bajadas. 800-1220 m (2600-4000 ft) *Fraga & Denslow 488.*

Eriogonum heermannii **Durand & Hilg. var.** *heermannii* Small shrub. Occasional on desert slopes. 1000-1400 m (3300-4500 ft) *Fraga, Boyd, Denslow & Gross 379.*

Eriogonum inflatum **Torr. & Frém.** Perennial herb. Common on desert slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga & Fraga 102.*

Eriogonum maculatum **A. A. Heller** Annual. Occasional in open habitats on fine granite sand. 915-1500 m (3000-5000 ft) *Fraga, De Groot & Porter 629.*

‡*Eriogonum nidularium* **Cov.** Annual. Occasional in open habitats on fine granite sand. 915-1400 m (3000-4500 ft) *Fraga & McGlaughlin 1151.*

Eriogonum nudum **Douglas ex Benth. var.** *westonii* **(S. Stokes) J. T. Howell** Perennial herb. Common on desert slopes. 1000-1500 m (3500-5000 ft) *Fraga, Honer & Soza 731.*

Eriogonum plumatella **Durand & Hilg.** Small shrub. Occasional on bajadas and desert slopes. 915-1220 m (3000-4000 ft) *Fraga & Fraga 540.*

Eriogonum pusillum **Torr. & A. Gray** Annual. Common on find sandy soil in open habitats. 915-1500 m (3000-5000 ft) *Fraga & Denslow 505.*

Eriogonum reniforme **Torr. & Frém.** Annual. Rare on canyon bajadas and desert slopes. 8000-1000 m (2600-3300 ft) *Luthey 324* CAS.

‡*Eriogonum roseum* **Durand & Hilg.** Annual. Occasional on mountain slopes. 1600-1500 m (5500-5000 ft) *Fraga & De Groot 920.*

‡*Eriogonum saxatile* **S. Watson** Perennial herb. Occasional on rock outcroppings on mountain slopes. 1220-1500 m (4000-5000 ft) *Fraga & McGlaughlin 116*1.

Eriogonum trichopes **Torr.** Annual. Uncommon on bajadas and desert slopes. 915-1524 m (3000-5000 ft) *Fraga & Denslow 52*0.

Eriogonum wrightii **Benth. var.** *subscaposum* **S. Watson** Small shrub. Common on open pinyon woodland and sagebrush scrub on mountain slopes. 1100-1500 m (3600-5000 ft) *Fraga & Brock 1343.*

‡*Pterostegia drymarioides* **Fisch. & C.A. May** Annual. Uncommon in shaded areas in moist crevices. 1100-1500 m (3600-5000 ft) *Kempton, De Groot & Fraga 251.*

Portulacaceae

alandrinia ciliata **(Ruiz & Pav.) DC.** Annual. Uncommon on canyon floor and shaded north slopes. 1400-1500 m (4500-5000 ft) *Fraga & Maurice 252.*

alyptridium monandrum **Nutt. in Torr. & A. Gray** Annual. Occasional on desert slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga & Denslow 491.*

laytonia parviflora **Douglas ex Hook. subsp.** *parviflora* Annual. Occasional from north slopes in moist areas under rock crevices. 915-1500 m (3000-5000 ft) *Fraga Boyd, Denslow & Gross 322.*

laytonia parviflora **Douglas ex Hook. subsp.** *viridis* **(Davidson) John M. Miller & Chambers** Annual. Uncommon from north slopes in moist areas under rock crevices. 915-1220 m (3000-4000 ft) *Fraga, Boyd, Denslow & Gross 333.*

Claytonia perfoliata **D. Donn ex Willd. subsp.** *perfoliata* Annual. Occasional from north slopes in moist areas under rock crevices. 1220-1500 m (4000-5000 ft) *Fraga & Griffith 1142.*

Ranunculaceae

elphinium hansenii **(E. Greene) E. Greene subsp.** *kernense* **(Davidson) Ewan** Geophyte. Uncommon in shade of mixed coniferous forest on steep mountain slopes. 2200-2400 m (7000-7800 ft) *Fraga & Grffith 1226.*

elphinium parishii **A. Gray subsp.** *parishii* Geophyte. Common in canyons and desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Denslow 504.*

Rhamnaceae

Ceanothus greggii **A. Gray var.** *vestitus* **(Greene) McMinn** Large shrub. Occasional in open pinyon woodland in the upper reaches of canyons and mountain slopes. 1000-1500 m (3400-5000 ft) *Fraga & Mills 1244.*

hamnus tomentella **Benth. subsp.** *cuspidata* **(Greene) J. O. Sawyer** Large shrub. Occasional at the upper reaches of canyons. 1220-1500 m (4000-5000 ft) *Fraga & Maurice 174.*

Rosaceae

ercocarpus ledifolius **Nutt. var.** *ledifolius* Large shrub. Occasional on open mountain slopes. 1500-1740 m (5000-5700 ft) *Fraga & Anderson 1005.*

oleogyne ramosissima **Torr.** Small shrub. Common on desert slopes. 1100-1400 m (3500-5000 ft) *Fraga, Boyd, Denslow & Gross 331.*

runus andersonii **A. Gray** Large shrub. Occasional on desert slopes and in the shade of pinyon woodland. 1100-1500 m (3500-5000 ft) *Fraga, Griffith & Walker 572.*

Purshia tridentata **(Pursh) DC. var. *glandulosa* (Curran) M. E. Jones** Large shrub. Occasional at the upper reaches of canyons and on mountain slopes in pinyon-oak woodland. 1200-1740 m (3800-5700 ft) *Fraga & DeGroot 929.*

Rubiaceae

‡***Galium hallii*** **Munz & I. M. Johnst.** Small shrub. Occasional on mountain slopes in pinyon-oak woodland and mixed coniferous forest. 1700-2300 m (5600-7500 ft) *Fraga & Anderson 1261.*

Galium matthewsii **A. Gray** Perennial herb. Occasional on desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Fraga 1106.*

Salicaceae

‡***Populus fremontii*** **S. Watson subsp. *fremontii*** Tree. Occasional in riparian areas. 915-1500 m (3000-5000 ft) *Fraga & Mills 1210.*

Salix lasiolepis **Benth.** Large shrub. Common in riparian scrub. 980-1500 m (3200-5000 ft) *Fraga & Mills 1204.*

Saururaceae

Anemopsis californica **(Nutt.) Hook. & Arn.** Perennial herb. Uncommon on moist banks above riparian area. 1000-1220 m (3300-4000 ft) *Fraga & Fraga 121.*

Scrophulariaceae

Antirrhinum kingii **S. Watson** Annual. Uncommon from desert slopes and near the base of large granitic outcrop. 915-1220 m (3000-4000 ft) *O'Brien & Thibault s.n. 18 Apr 2003.*

‡***Collinsia callosa*** **Parish** Annual. Occasional on desert and mountain slopes or exposed ridgelines. 1500 m (5000 ft) *Fraga, De Groot & Porter 655.*

‡***Keckiella breviflora*** **(Lindl.) Straw var. *breviflora*** Small shrub. Occasional on open mountain slopes and upper reaches of canyons. 1220-5000 m (4000-5000 ft) *Fraga, Honer & Soza 747.*

Mimulus androsaceus **Greene** Annual. Uncommon on gravelly flats that obtain moisture from springs. 1160-1220 m (3800-4000 ft) *Fraga, Boyd, Denslow & Gross 339.*

Mimulus aurantiacus **Curtis var. *pubescens* (Torr.) D. M. Thompson** Small shrub. Common, growing from crevices in large granite boulders. 975-1500 m (3200-5000 ft) *Fraga & Fraga 110.*

Mimulus cardinalis **Benth.** Perennial herb. Uncommon in riparian areas. 975-1220 m (3200-4000 ft) *Fraga & Maurice 162.*

‡***Mimulus floribundus*** **Douglas ex Lindl.** Annual. Uncommon in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1637.*

***imulus fremontii* (Benth.) A. Gray** Annual. Uncommon on bajadas and open mountain slopes. 915-1500 m (3000-5000 ft) *Fraga & Denslow 484.*

***imulus guttatus* DC.** Annual or perennial herb. Occasional in moist soil of riparian areas. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 147.*

***Mimulus pilosus* (Benth.) S. Watson** Annual. Locally common in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1636*

***Penstemon incertus* Brandegee** Small shrub. Occasional on desert slopes and canyon floor. 1000-1500 m (3400-5000 ft) *Fraga 1202.*

Solanaceae

***Datura wrightii* Regel** Perennial herb. Uncommon in disturbed areas, especially roadside. 800-1220 m (2600-4000 ft) *Fraga & Maurice 157.*

***ycium andersonii* A. Gray** Small shrub. Common on desert slopes and canyon floor. 850-1220 m (2800-4000 ft) *Fraga & Dnslow 473*

***ycium cooperi* A. Gray** Small shrub. Occasional on desert slopes and canyon floor. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 1109*

***Nicotiana attenuata* Torr.** Annual. Uncommon on desert slopes and canyon floor. 1400-1500 m (4500-5000 ft) *Fraga & DeGroot 636.*

Urticaceae

***rtica dioica* L. subsp. *holosericea* (Nutt.) Thorne** Perennial herb. Uncommon at the edge of riparian areas. 1100-1220 m (3500-4000 ft) *Fraga,Buck, McAllister, Morgan & Virgen 955.*

Verbenaceae

erbena lasiostachys* Link subsp. *lasiostachys Perennial herb. Rare; from one historical collection in Short Canyon. *Henry s.n. 4 Jul 1991.*

Viscaceae

***rceuthobium occidentale* Engelm.** Parasitic perennial herb. Occasional at the upper reaches of canyons commonly growing on *Pinus sabiniana.* 1000-1700 m (3400-5500 ft) *Fraga, Honer & Soza 702.*

***horadendron villosum* (Nutt. in Torr. & A. Gray) Nutt.** Parasitic perennial herb. Occasional on *Quercus chrysolepis* at the upper reaches of canyons. 1220-1500 m (4000-5000 ft) *Fraga & Boyd 388.*

Vitaceae

Vitis girdiana **Munson** Liana. Common, in riparian areas commnly growing on other shrubs. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 106*

Zygophyllaceae

Larrea tridentata **(Sessé & Moc. ex DC.) Coville** Large shrub. Common on bajadas in sandy soil. 800-1200 m (2600-3800 ft) *Fraga & Denslow 480.*

******Tribulus terrestris* **L.** Annual. Locally common along disturbed roadsides near highways. 792 m (2600 ft) *Fraga, Brock, Fisher & Oberlin 1659.*

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Agavaceae

Nolina parryi **S. Wats.** Succulent shrub. Occasional on desert slopes and upper reaches of the canyon. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 103.*

Yucca brevifolia **Engelm.** Tree. Common on canyon floor, northern desert slopes and upper reaches of the canyon. 1100-1500 m (3500-5000 ft) *Fraga, DeGroot & Porter 619.*

Cyperaceae

Carex alma **L. H. Bailey** Perennial herb. Uncommon in riparian areas, more commonly at the upper reaches of the canyon. 975-1500 m (3200-5000 ft) *Fraga & Gross 970.*

‡*Eleocharis parishii* **Britton** Perennial herb. Occasional on moist edges of riparian areas. 1100-1500 m (3600-5000 ft) *Fraga & Soza 788.*

Juncaceae

Juncus balticus **Willd.** Perennial herb. Occasional on edges of riparian areas, often on banks above stream channels. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 123.*

Juncus rugulosus **Engelm.** Perennial herb. Uncommon on edges of riparian areas, in moist soil. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 143.*

Juncus xiphioides **E. Meyer** Perennial herb. Occasional in moist soil of riparian areas. 1100-1400 m (3500-4500 ft) *Fraga & Tessel 144.*

Lemnaceae

Lemna gibba **L.** Aquatic annual. Uncomon in standing water of stream channels. 1100-1400 m (3500-4500 ft) *Fraga & Anderson 1024.*

Liliaceae

***Allium fimbriatum* S. Watson var. *mohavense* Jeps.** Geophyte. From bajadas on sandy soil documented near SR 14. 800 m (2600 ft) *McNeal 3048.*

***llium lacunosum* S. Watson var. *davisiae* (M. E. Jones) McNeal & Ownbey** Geophyte. Occasional on floor of canyons in gravelly soil. 1100-1220 m (3600-4000 ft) *Fraga, Griffith & Walker 562.*

***ichelostemma capitatum* (Benth.) Keator var. *pauciflorum* (Torr.) Keator** Geophyte. Occasional on mountain and desert slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga & Fraga 197.*

***Muilla coronata* E. Greene** Geophyte. Uncommon on sandy bajadas and sandy desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 415.*

Poaceae

***chnatherum hymenoides* (Roem. & J. A. Schultes) Barkworth** Perennial herb. Common on sandy bajadas, and occasional on exposed ridges and the upper reaches of canyons. 850-1500 m (2800-5000 ft) *Fraga & Denslow 497.*

***chnatherum speciosum* (Trin. & Rupr.) M. E. Barkworth** Perennial herb. Common on canyon floor, and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 542.*

***Bromus diandrus* Roth** Annual. Occasional in disturbed moist sites, often adjacent to roads. 800-1400 m (2600-4500 ft) *Fraga & Soza 787.*

***Bromus rubens* L.** Annual. Common on desert slopes and canyon floor. 800-1500 m (2600-5000 ft) *Fraga & Fraga 113.*

***Bromus tectorum* L.** Annual. Common on canyon floor, desert slopes. Most abundant in open habitats on slopes. 1100-1500 m (3600-5000 ft) *Fraga & Maurice 217.*

***romus trinii* Desv.** Annual. Uncommon on desert slopes, often growing from between rock crevices. 1100-1400 m (3500-4500 ft) *Fraga, Griffith & Walker 564.*

***istichlis spicata* (L.) Greene** Perennial herb. Occasional on alkaline flats near stream channels. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 124.*

***lymus elymoides* (Raf.) Swezey subsp. *californicus* (J. G. Smith) Barkworth** Perennial herb. Common throughout the study area in open habitats on desert and mountain slopes. 918-1500 m (3000-5000 ft) *Fraga & Fraga 58.*

‡*Hordeum murinum* L. subsp. *glaucum* (Steud.) Tzvelev Annual. Uncommon, near stream channels with moist soil. 1220-1400 m (4000-4500 ft) *Fraga & Mills 1213.*

***eptochloa filiformis* (Lam.) Beauv.** Perennial herb. Rare; from one collection in a cement crack at Brady's Gas Station. 792 m (2600 ft) *Fraga, Brock, Fisher & Oberlin 1659.*

***Melica imperfecta* Trin.** Perennial herb. Occasional on mountain and desert slopes, often in shaded areas. 1100-5000 m (3500-5000 ft) *Fraga & Griffith 1114.*

***Muhlenbergia asperifolia* (Nees & Meyen) Parodi** Perennial herb. Occasional on alkaline flats near stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Tessel 153.*

Muhlenbergia rigens **(Benth.) Hitchc.** Perennial herb. Common on edges of stream channels and moist areas fed by springs. 1000-1400 m (3200-4500 ft) *Fraga & Maurice 163.*

Phragmites australis **(Cav.) Steud.** Perennial herb. Uncommon, near the stream edge. 1100-1200 m (3500-3800 ft) *Fraga, Buck, McAllister, Morgan & Virgen 950.*

Poa secunda **J. Presl subsp.** *secunda* Perennial herb. Common throughout the site, on desert slopes and bajadas. 1100-1500 m (3500-5000 ft) *Fraga & Denslow 177.*

Polypogon monspeliensis* **(L.) Desf. Annual. Common, in moist soil of riparian areas. 975-10660 m (3200-3500 ft) *Fraga & Denslow 177.*

*‡*Schismus arabicus* **Nees** Annual. Uncommon on bajadas and desert slopes in sandy areas. 850-1220 m (2800-4000 ft) *Fraga & Fraga 114.*

Schismus barbatus* **(L.) Thell. Annual. Common on desert slopes and bajadas, most abundant in Creosote Bush Scrub. 800-1220 m (2600-4200 ft) *Fraga & Fraga 205.*

Sporobolus flexuosus **(Vasey) Rydb.** Perennial herb. Uncommon on desert slopes and sandy flats above stream channels. 1100-1160 m (3500-3800 ft) *Fraga & Maurice 167.*

Vulpia microstachys **(Nutt.) Munro in Benth var.** *microstachys.* Annual. Uncommon in open habitats on desert slopes and canyon floor. 915-1520 m (3000-5000 ft) *Fraga, Gross & Navid-Ara 1069.*

Vulpia microstachys **(Nutt.) Munro in Benth. var.** *pauciflora* **(Beal) Lonard & Gould** Annual. Uncommon, from desert slopes. 1190 m (3900 ft) *Fraga, Boyd, Denslow & Gross 285b.*

Vulpia octoflora **(Walter) Rydb.** Annual. Occasional in open habitats on canyon floor, desert slopes and bajadas. 915-1380 m (3000-4500 ft) *Fraga, Anderson & Stolzenburg 1025.*

Typhaceae

Typha domingensis **Pers. Perennial herb.** Uncommon, near stream channels and spring fed areas. 1100-1220 m (3500-4000 ft) *Fraga & Brock 1342.*

APPENDIX – UNVOUCHERED TAXA

hose taxa which are believed to be misidentified are marked by and equal sign (=) with the appropriate identification following.

Apocynaceae

msonia tomentosa **Torr. & Frém.** Perennial herb.
pocynum cannabinum **L.** Perennial herb

Asteraceae

ster lanceolatus **Willd. ssp.** *hesperius* **(A. Gray) Semple & J. Chmielewski** Perennial herb.
hrysothamnus paniculatus **(A. Gray) H. M. Hall** Small shrub
irsium occidentale **(Nutt.) Jeps. var.** *californicum* **(A. Gray) D. J. Keil & C. Turner** Biennial herb = *Cirsium occidentale* **var.** *venustum*
einandra kellogii. **Greene** Annual = *Deinandra mohavensis*
uthamia occidentalis **Nutt.** Perennial herb
Gnaphalium palustre **Nutt. Annual**
olidago spectabilis **(D. Eaton) A. Gray** Perennial herb = *Solidago confinis*
tylocline micropoides **A. Gray** Annual

Boraginaceae

ryptantha oxygona **(A. Gray) Greene** Annual

Brassicaceae

epidium flavum **Torr. var.** *flavum* Annual

Campanulaceae

emacladus gracilis **Eastw.** Annual = *Nemacladus sigmoideus*
emacladus interior **(Munz) G. Robb**. Annual
emacladus secundiflorus **G. Robb.** Annual

Caryophyllaceae

renaria macradenia **S. Watson var.** *ferrisiae* **Maguire** Tufted perennial = *Arenaria macradenia* **S. Watson var.** *arcuifolia*
Spergula arvensis **L. ssp.** *arvensis* Annual

Crassulaceae

Dudleya calcicola **Bartel & Shevock** Succulent perennial herb = *Dudleya saxosa* **subsp.** *alioides*

Euphorbiaceae

Chamaesyce micromeria **(Engelm.) Wooton & Standley** Annual
Chamaesyce polycarpa **(Benth.) Millsp.** Perennial herb

Fabaceae

Trifolium gracilentum **Torr. & A. Gray** Annual

Hydrophyllaceae

Phacelia novenmillensis **Munz** Annual = *Phacelia curvipes* or *Phacelia humilus* **Torr. ex Gray var.** *dudleyi* **J.T. Howell**

Molluginaceae

Mollugo verticillata* **L. Annual

Nyctaginaceae

Mirabilis bigelovii **A. Gray var.** *bigelovii* Perennial herb = *Mirabilis bigelovii* **var.** *retrorsa*

Plantaginaceae

Plantago major* **L. Perennial herb

Polemoniaceae

Gilia latiflora **(A. Gray) A. Gray ssp.** *davyi* **(Milliken) A. D. Grant & V. E. Grant** Annual
Gilia tricolor **Benth.** Annual

Polygonaceae

Eriogonum nudum **Douglas ex Benth. var.** *pubiflorum* **Benth.** Perennial herb = *Eriogonum nudum.* **var.** *westonii*
Oxytheca perfoliata **Torr. & A. Gray** Annual

Ranunculaceae

anunculus cymbalaria **Pursh ssp.** *saximontanus* **(Fernald) Thorne** Perennial
halictrum **indet.** Perennial herb

Rubiaceae

alium munzii **Hilend & J. Howell** Perennial herb = *Galium mathewsii*
alium stellatum **Kellogg var.** *eremicum* **Hilend & J. Howell** Small shrub

Salicaceae

alix exigua **Nutt.** Large shrub
alix lucida **Muhlenb. ssp.** *lasiandra* **(Benth.) E. Murray** Tree = *Salix laevigata*

Scrophulariaceae

imulus palmeri **A. Gray** Annual
imulus rubellus **A. Gray** Annual

Solanaceae

olanum americanum **Mill.** Annual or perennial herb
olanum sarrachoides **Sendtner ex Martius** Annual

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Poaceae

Avena fatua **L.** Annual
romus arizonicus **(Shear) Stebbins** Annual
Vulpia myuros **(L.) C. C. Gmel. var.** *hirsuta* **(Hackel) Asch. & Graebn.**Annual = *Vulpia microstachys* **(Nutt.) Munro in Benth. var.** *pauciflora*

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NOTEWORTHY COLLECTIONS

Lichens and Lichenicolous Fungi

LICHENOCHORA VERRUCICOLA (Wedd.) Nik. Hoffm. & Hafellner.

1st collection. Santa Barbara County: Los Padres National Forest, Figueroa Mountain, Davy Brown Trailhead on Road 7N07. USGS 7.5' Figueroa Mountain Quadrangle. 34° 43' 47"N, 119° 58' 14"W; elevation ~1292 m. *Quercus douglasii* and *Pinus coulteri*-dominated woodland.. On *Aspicilia* species. Shirley Tucker # 35933 (SBBG), Det. by K. Knudsen.

2nd collection. San Diego County: Anza Borrego State Park, Pena Spring. USGS 7.5' Tub Canyon Quadrangle. 33° 13' 29"N, 116° 27' 41"W; elevation 1035 m. Scattered chaparral. On *Aspicilia* species. Knudsen # 3682 (UCR, hb. Etayo) Det. by Javier Etayo.

3rd collection. San Diego County: Palomar Mountain State Park, Palomar Mountain, below Nat Harrison Grade, Adams Trail. USGS 7.5' Boucher Peak Quadrangle. 33° 20' 41"N, 116° 55' 14"W; elev. 1,475 m. On *Aspicilia* species. Knudsen # 2934.2 & Mary Knudsen (UCR) Det. By K. Knudsen.

Previous knowledge. Lichenicolous fungi have long relations with host species and may be useful as ecological indicators when their taxonomy and ecology is better understood. They generally occur in habitats that have been undisturbed for long periods. *Lichenochora verrucicola* is a lichenicolous fungus restricted to species of the crustose genus *Aspicilia.* It is known only in North America from South Dakota and a single site in northern Arizona (J. Hafellner & P. Navarro-Rosinès. 2004. "Lichenochora" *In* Nash *et al.*, Lichen Flora of the Greater Sonoran Region, Vol. 2, p. 756-759). It has also been collected in France and Spain.

Significance. In California *L. verrucicola* occurs on an *Aspicilia* species that appears to be the undescribed taxon which Bjorn Owe-Larsson will describe as *Aspicilia cuprea* (Owe-Larsson, *pers comm.) L. verrucicola* forms dark galls and seems to have a pathogenic effect on its host. The *Aspicilia* when heavily infested produces a reddish powder that looks like iron ore dust and sometimes stains the areoles of the host. It is probably not rare in California but under-collected. Though the large spores of *L. verrucicola* are described as colorless, an outer perispore is often present which is a light brownish hue.

RINODINA ZWACKHIANA (Kremp.) Körb. San Bernardino County: San Bernardino Mountains, north side of Sugarlump. USGS 7.5' Moonridge Quadrangle. 34° 12' 37"N, 116° 51' 11"W; elevation 8499 m. Dolomite outcrops among *Abies concolor.* Underneath a dolomite ledge growing among small stalactites. Knudsen #1607 & Chris L. Wagner (UCR, hb. Lendemer). Det. by J.W. Sheard.

Previous knowledge. Rinodina zwackhiana is a calciphile often associated with water seepage on carbonate rock, sandstone, and shale. It is known from southern Europe and central Asia. In North America its distribution is centered in the Colorado Plateau. It is known from northern Arizona. (J.W. Sheard. 2004. "Rinodina" *In* Nash *et al.*, Lichen Flora of the Greater Sonoran Region, Vol. 2, p. 467-502). It has not been reported from California (Shirley Tucker and Bruce Ryan. 2006. Constancea 84: Revised Catalog of Lichens, Lichenoles, and Allied Fungi in California.) It has a pigmented epihymenium similar to some *Lecania* species which is K+ rose to violet, and *Bicincta*-type spores (which also occur in *R. bischoffii,* common on carbonate rock in the San Bernardino Mountains but with a K- brown epihymenium).

Significance. This is the first report of *R. zwackhiana* from California. Based on current collections of lichens occurring on carbonate rock in San Bernardino Mountains, it is apparently rare.

STIGMIDIUM PSORAE (Anzi) Hafellner San Diego County: Anza-Borrego State Park, No Return Canyon, off of Split Mountain Road. USGS 7.5' Harper Canyon Quadrangle. 33° 03' 16"N, 116° 08' 10"W; elevation 205 m. Wash with Colorado Desert riparian scrub and *Bursera microphylla.* On squamules of *Psora crenata.* Knudsen 5875 & Rolf Muerrter (UCR, hb. Etayo).

Previous knowledge. Stigmidium psorae is a lichenicolous fungus restricted to *Psora* species, a genus that occurs on soil. *S. psorae* is known from Europe, Afghanistan, and Asia. It has not been known from California (Shirley Tucker and Bruce Ryan. 2006. Constancea 84: Revised Catalog of Lichens, Lichenoles, and Allied Fungi in California), and is known from only one collection in western North America: on *Psora decipiens* in south-central Arizona (D. Triebel & M.E.S. Cáceres "Stigmidium" in Nash *et al.*, Lichen Flora of the Greater Sonoran Region, Vol. 2, pp. 703-707, 2004).

Significance. Stigmidium psorae is reported new for California on *Psora crenata.* Statewide it appears to be rare, as is its main host *P. crenata.* It is a parasymbiont on the host, appearing to have no pathogenic effect. The determination was verified by Javier Etayo.

TRAPELIA PLACODIOIDES Coppins & P. James.

1st collection. San Diego County: Palomar Mountain: Palomar State Park, above and below Nate Harrison Grade. USGS 7.5' Boucher Hill Quadrangle. 33° 20' 21"N, 116° 55' 36"W; elevation 1,412.1 m. Mixed conifers and oaks on north slope. On granite boulders in shade. Knudsen # 2749 w/Mary Knudsen (ASU, SD, UCR).

2nd collection. Orange County: Weir Canyon, north of Windy Ridge road on north slope. 33° 50' 13"N, 117° 43' 15"W; elevation 342 m. Mixed mesic chaparral, in openings on sandstone boulders (Knudsen#6275 UCR).

Previous knowledge. Trapelia placodioides, like many lichens adapted to temperate climates, has a North American-European distribution pattern. It has been collected in eastern North America from New York as far west as Minnesota (Wetmore # 33631, MIN & ASU). For a description of this lichen, see Purvis, O.W. 1992. "Trapelia"in Purvis, O.W. *et al.,* The Lichen Flora of Great Britian and Ireland, pp.610-612; for good images, see The Information System on Italian Lichens http://dbiodbs.univ.trieste.it . *T. placodioides* rarely produces apothecia and is generally sterile. It characteristically produces soredia primarily on the edges of areoles, though in older specimens the center of areole begins to erode. Its cortex is whitish, often with a pinkish undertone. Its thallus and soredia are C+ red.

Significance. These are the first reports of *T. placodioides* from western North America and California (Shirley Tucker and Bruce Ryan. 2006. Constancea 84: Revised Catalog of Lichens, Lichenoles, and Allied Fungi in California). Both populations were highly restricted and are probably relics of an ice age flora. At the Weir Canyon site the species was dominant. Many specimens were not yet producing soredia, suggesting the population may have expanded since the 1982 fire which had incinerated the whole slope's chaparral.

Special thanks to Javier Etayo for his guidance in studying lichenicolous fungi, J.W. Sheard and J.C. Lendemer, and Shirley Tucker.

— ***Kerry Knudsen,*** *Lichen Curator, The Herbarium, Department of Botany & Plant Sciences, University of California, Riverside, CA, 92521-0124.*

BOOK REVIEW

California Native Plants for the Garden by Carol Bornstein, David Fross, & Bart O'Brien. 2005. Cachuma Press, P.O. Box 560, Los Olivos, CA 93441. 280 pp; includes 450 color photos. (ISBN 0-9628505-8-6) $27.96 Paperback, (ISBN 0-9628505-9-4) $37.95 Hardcover.

With over 450 beautiful color photographs, California Native Plants for the Garden accomplishes what it set out to do: make California native gardening appealing and provide a reference for people to get started. The authors, experts in the field along with their contributors (the acknowledgements list reads like a Who's Who in the California native horticulture field), reflect the depth of their knowledge and experience. The writing is clear and concise, the layout aesthetically pleasing (good enough to compete with expensive coffee table books), and the color photos more than do justice to the California species featured.

The authors begin with four chapters (essays really) that cover the history, culture, landscape design considerations, and maintenance needed for California native plants. I found myself nodding my head and agreeing with all that they opined. I especially enjoyed their coverage of proper irrigation practices, warning about over-fertilization, review of pruning techniques, and review of environmental issues. The chapter describing the various plant communities was well written, clearly describing the diversity of flora that makes California unique; I was disappointed that the next section, Plant Profiles, wasn't organized using the same plant communities format (rather than alphabetically by genus)– it would have been the perfect chance to reorient the gardeners perspective towards habitat connections as opposed to highlighting form and size (perhaps next edition?).

The bulk of the book consists of the Plant Profiles (167 perennials, 15 annuals, and 11 bulbs). With over 6,300 native taxa in the state, I imagine the authors had a hard time narrowing it down to the 200 featured. It left me wanting more (please make the next edition larger), but perhaps that was the point – this is only the tip of the iceberg – and if readers walk away feeling excited and passionate about California natives, then the authors have successfully conveyed their message.

As a nursery professional, I appreciated the inclusion of horticultural requirements (light, soils, water, range) in the Plant Profiles, and would encourage the addition of plant spacing and propagation information. Additionally, native plants make great replacements for invasive and non-native species; I would have loved to hear the author's suggestions on which species could be switched out (e.g. "Toyon makes beautiful alternative to Pittosporum…"). Again, wanting more, boy those authors know how to pique ones interest.

That's not to say that what IS included in the Profiles isn't interesting; quite the contrary, there are many delicious tidbits of information contained within to guarantee hours of reading enjoyment and helpful instruction. I especially appreciated their extended coverage of Manzanitas, Wild Lilacs, Oaks, the Sages, and California Fuchsia. Scour these pages carefully, because contained within are many good tips on pest and disease control, pruning, appropriate native companions, and available cultivars. And their descriptions are appealing, easily understood by the laymen (no six dollar scientific jargon), and evocative (colors, smells, and textures give you the sense of being there).

The closing section of the book contains 30 helpful lists of everything from allergenic plants to species for woodland gardens. It also contains appendices listing further resources (so that's where I go when I'm craving more...) as well as a glossary of horticultural terms. The place-holding flaps on the inside of both the front and back cover accentuate the thought and usefulness that this book will have for many.

Finally, I couldn't help but pull out my worn version of *Sunset Western Garden Book.* I held them side-by-side and realized that for California native plant lovers, this book is what we wish the Sunset book had been. This book is definitely worth the money and is sure to be well used.

— ***Michael Herrera****, Catalina Island Conservancy, James H. Ackerman Native Plant Nursery, P.O. Box 2739, Avalon, CA 90704;* mherrera@catalinaconservancy.org

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No. 3 Endangered Plant Communities of Southern California, Proceedings of the 15th Annual SCB Symposium, edited by Allan A. Schoenherr, 114 pp...$12.00

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> Herbarium specimens as documents: purposes and general collecting techniques, by T.S. Ross [from *CROSSOSOMA* 22(1):3-39, 1996] .... $3.95 each; 10 for $22.50

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VASCULAR FLORA OF THE GRANITE MOUNTAINS, EASTERN SAN BERNARDINO COUNTY: AN ANNOTATED CHECKLIST

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ABSTRACT: The Granite Mountains lie within the southwest corner of the Mojave National Preserve (MNP) in eastern San Bernardino County, California. The 27,700 ha (107 sq. mi) area comprises all of the Granite Mountains, the majority of the alluvial fans surrounding the range, and includes the 3,600 ha University of California's Sweeney Granite Mountains Desert Research Center (GMDRC). The diverse floristic composition of the Granite Mountains includes elements of the Mojave, Great Basin, and Sonoran/Colorado Deserts. The flora of this area has been variously documented in previous summaries, but substantial geographical and temporal gaps remained, warranting additional work. A comprehensive field and herbaria survey of the entire range was conducted from 1994-2005, adding an additional 91 taxa to what was previously summarized for the area. To date, a total of 499 specific and intraspecific taxa in 255 genera from 70 families have been documented, of which 39 (8%) are exotics. A total of 98% of the known taxa within the flora have been vouchered. The outcome of this comprehensive effort will further support research programs at the GMDRC, aid vegetation and rare plant management in the MNP, and provide a foundation to a larger ongoing effort by the author to complete a Flora of the MNP.

KEYWORDS: bajada, flora, floristics, Granite Mountains, Granite Mountains Desert Research Center, Mojave Desert, Mojave National Preserve, University of California.

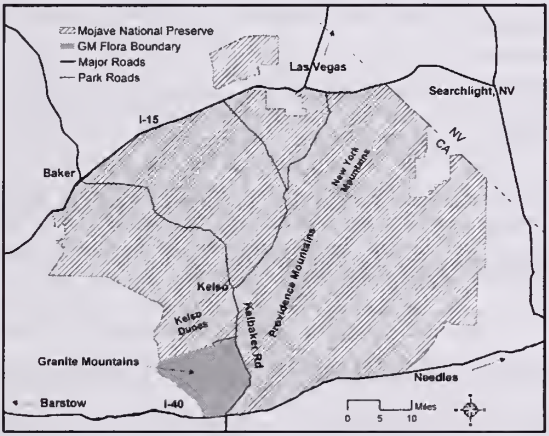
INTRODUCTION

The Granite Mountains and its surrounding alluvial fans lie at the southwest corner of the Mojave National Preserve (MNP, National Park Service) in eastern San Bernardino County, California. Elevations within the study area range from Granite Peak, the highest point in the range at 2,100 m (6,800 ft) to 700 m (2,200 ft) near the Kelso Dunes. Positioned at the southern terminus of a long chain of primarily calcareous mountain ranges (Providence, New York, McCullough) that extend northeastward into southern Nevada, the Granite Mountains are composed primarily of granitic and metamorphic rocks. Rugged and precipitous throughout, sharp ridges separate at least 11 major drainages, which spill from rocky canyons into large washes that bisect the massive alluvial fans (bajadas) of lower elevations.

The majority of the lands within the study area lie within the MNP (created in 1994), comprised of mostly roadless areas designated as federal Wilderness. Included within the study area on the east side of the range is the 3,600 ha Sweeney Granite Mountains Desert Research Center (GMDRC), administered by the University of California's

Natural Reserve System. Established in 1978, the GMDRC currently hosts more than 120 active research projects by investigators from a diverse array of national and international academic institutions. Some studies are designed to span many decades. To protect the more sensitive studies, access to GMDRC lands is restricted, and managed through an application process.

The floristic study area (Map 1) totals 27,700 ha (107 sq. mi). Its perimeter boundaries are delineated as follows: East boundary - Kelbaker Road from I-40 north to the transmission line dirt road 200 m south of the access road to the Kelso Dunes; North boundary - the transmission line dirt road along the south end of the Kelso Dunes, from Kelbaker Rd west to the Preserve boundary at Budweiser Wash; West boundary - from the transmission line dirt road at Budweiser Wash (near Kelso Dunes) south to I-40; South boundary - along I-40 and the MNP boundary, from the southwest corner of the MNP east to Kelbaker Rd.



Map 1. Granite Mountains Flora within Mojave National Preserve, Eastern San Bernardino County, California.

METHODS

A number of floristic summaries have been produced for portions of this area, in particular those by Hart et al. (1979) and Thorne et al. (1981). Previous floristic surveys of the study area were reviewed and summarized, and additional historical collections were searched for at RSA-POM, UC/JEPS, UCR, GMDRC, and UNLV. In addition, more than 2,200 hours of field surveys were conducted from1994 to 2005, targeting areas with few or no historical collections. Surveys also targeted summer annuals and summer/fall-flowering taxa, which are notoriously lacking in herbaria. Collections are primarily deposited at GMDRC, UCR, or RSA-POM.

RESULTS AND DISCUSSION

The vascular flora of the Granite Mountains to date consists of 70 families, 255 genera and 499 specific and intraspecific taxa. A surprising total of 92 taxa were added to the flora during the course of this project (i.e., since 1994). Of the 499 taxa, 460 are native, 13 are listed (as either List 2 or List 4) by California Native Plant Society (CNPS), 33 are non-native invasives, and 6 are historic cultivars. For the following analysis, the 6 taxa that are historic cultivars are not considered, thus reducing the "naturalized" flora to a total of 68 families, 250 genera, and 493 taxa (Table 1).

Table 1.
Taxonomic Classification of the Vascular Plants in the Granite Mountains Flora

	Families	Genera	Species	% of all species
Pteridophytes	1	5	9	1.8
Gymnosperms	2	2	3	0.6
Gnetophytes	1	1	4	0.8
Dicots	58	205	411	83.3
Monocots	6	37	66	13.4

The ten largest families comprise 64% of the taxa in the study area, as shown in Table 2. As is the case in most floras in the western U.S., Asteraceae is by far the largest family, representing 19% of the taxa. Approximately 40% of the families listed for California (Hickman 1993) are found in the Granite Mountains.

Table 2.
Ten Largest Families of Vascular Plants in the Granite Mountains Flora

Family	# of genera	# of species	% of all species
Asteraceae	54	94	19.1
Poaceae	22	45	9.1
Polemoniaceae	9	30	6.1
Polygonaceae	7	27	5.5
Fabaceae	8	24	4.9
Brassicaceae	16	23	4.7
Boraginaceae	6	21	4.3
Hydrophyllaceae	7	20	4.1
Onagraceae	3	17	3.5
Scrophulariaceae	5	14	2.8
Totals	137	315	64.0%

The eastern Mojave Desert hosts a number of large, evolutionarily dynamic genera that appear to have undergone relatively recent radiations (Barbour & Major 1988). Six of the genera in the Granite Mountains Flora contain 15% of all taxa in the Flora (Table 3).

Table 3.
Six Largest Genera of Vascular Plants in the Granite Mountains Flora

Genus	# of taxa	% of all taxa
Eriogonum	19	3.8
Phacelia	13	2.6
Cryptantha	12	2.4
Gilia	12	2.4
Astragalus	10	2.0
Camissonia	10	2.0
Totals:	76	15.0%

The Granite Mountains Flora exemplifies the transitional nature of the eastern Mojave Desert, where floristic elements derived from the Great Basin and Sonoran Deserts interact with Mojave Desert endemics. Due to the southwestern-most position of the Granites in the north-to-south chain of high ranges in the east Mojave, there are also strong affinities with the southern deserts. A more detailed analysis of the affinities with neighboring ranges can be found in Hart et al. (1979).

A total of 33 non-native invasive plants were documented in the flora representing 8% of the total taxa (Table 4). Many of these however were isolated waifs, so the naturalizing exotic species represent only 4% of the flora. Regardless, this is a relatively small proportion compared to the entire California flora, which is 17% non-native.

With 460 native taxa, the Granite Mountains flora encompasses 33% of the taxa in the California Mojave Desert (Baldwin et. al., 2002) in an area less than 0.5% of that area. Finally, 46% of the natives are annuals, whereas 82% of the exotics in the flora are annuals.

Table 4.
Summary of lifeforms in the Granite Mountains Flora

	Annual	Perennial Herb	Suffruticose Perennial	Shrub	Tree
Native	200	120	38	93	9
Non-native	27	4	1	1	0
Total (%)	227 (46)	124 (25)	39 (8)	94 (19)	9 (2)

The Granite Mountains represent only one of many mountain ranges in the east Mojave Desert, but one of the most floristically studied areas of the Mojave Desert. And while this effort has been comprehensive, it is still a work in progress as additional taxa continue to be added. Clearly, the less collected ranges and basins in the east Mojave remain even greater frontiers for floristic discovery (André, 2005, Clokey, 1951). A more comprehensive summary of this checklist, including a full analysis of rarity, endemism and regional floristic relationships, will be presented as part of the author's forthcoming Flora of the Mojave National Preserve.

ACKNOWLEDGEMENTS

I wish to first thank the early efforts of Bruce Stein, Dan Warrick, and Ken Hart, for their inspiring Granite Mountains Resource Survey in 1979, and to Robert Thorne, Barry Prigge and James Henrickson for their extensive work summarized in Thorne et. al. (1981). Both of these efforts were significant contributions to the floristic knowledge of the Granites, from which I have been fortunate to build from. There are far too many individuals to name here, but I give thanks to all of those that provided many hours of assistance in the field and herbarium, most notably Glenn Clifton, Abbie Deneh, Julie Evens, Jeff Galvin, Tasha La Doux, Barbara Pitzer, Jodi Ross, Jason Sexton and Valerie Soza.

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APPENDIX 1. ANNOTATED LIST OF VASCULAR PLANTS

This annotated list is arranged alphabetically by family then species. An asterisk (*) precedes a special-status plant listed by the California Native Plant Society. An exclamation mark (!) precedes an introduced or naturalized exotic species. A plus sign (+) precedes a non-naturalized historic cultivar. The scientific name is followed by common name and general abundance and habitat(s). Taxonomic nomenclature follows that of Baldwin et al. (2002) and Hickman (1993), or more recent treatments (eg. Parfitt and Gibson, 2003; Porter and Johnson, 2000, Windham, 1993). Elevation ranges are provided, followed by an italicized plant collector, collection number, and the code of the institution housing the collection. Institution codes are as follows: Rancho Santa Ana Botanic Garden *(RSA);* UC Berkeley (*UC* and *JEPS*); UC Riverside *(UCR);* UC Santa Barbara *(UCSB);* UC Santa Cruz *(UCSC);* UC Granite Mountains Desert Research Center *(GMDRC).* My use of abundance categories (e.g., common, infrequent, occasional, rare) are in reference to this Granite Mountains Flora only and may not indicate relative abundance of the taxa in a broader geographical context.

DIVISION I. POLYPODIOPHYTA (Ferns)

Pteridaceae (Brake Family)

***Adiantum capillus-veneris* L.** - Southern Maiden-hair. Rare, in moist caverns with perennial seeps in Granite Cove, 1300 m. *E.J. Lawlor 166 (UCR).*

***Cheilanthes covillei* Maxon** - Coville's Lip Fern. Frequent, at base of rocks and in boulder crevices, 900-2100 m. *J. André 3757 (GMDRC).*

***Cheilanthes parryi* (D. Eaton) Domin** - Parry's Cloak Fern. Frequent, at base of rocks and in crevices, 700-1500 m. *R.F. Thorne 50641 (RSA).*

***Cheilanthes viscida* Davenp.** - Viscid Lace Fern. Occasional, at base of rocks and in boulder crevices, 800-1800 m. *J. André 3976 (GMDRC).*

****Cheilanthes wootonii* Maxon** - Wooton's Lace Fern. Rare, in rocky outcrops. Unconfirmed voucher from Granite Pass area, 1300 m. *B.A. Stein s.n. (UCSC).*

Notholaena californica* D. Eaton ssp. *californica - California Cloak Fern. Rare, dry rocky slopes, ledges, crevices in boulders on east side of range, 1350 m. *S.F. Warrick 28(RSA).*

Pellaea mucronata* (D. Eaton) D. Eaton var. *mucronata - Common Bird's-foot Fern. Uncommon, rocky slopes above 1300 m. *R.F. Thorne 51612 (RSA).*

***Pentagramma triangularis* (Kaulf.) G. Yatskievych et al. ssp. *maxonii* (Weath.) G. Yatskievych et. al.** - Maxon's Goldback Fern. Occasional, rocky slopes up to 2100 m. *J. André 3975 (GMDRC).*

***Pentagramma triangularis* (Kaulf.) G. Yatskievych et al. ssp. *triangularis*.** - Goldback Fern. Uncommon, shaded slopes, rocky areas, 1200-2100 m. *C.W. Tilforth 1011(RSA).*

DIVISION II. CONIFEROPHYTA (Conifers)

Cupressaceae (Cypress Family)

Juniperus californica **Carriere** - California Juniper. Infrequent, but locally common, bajadas and bouldery slopes, east side of range, 1200-1500 m. *A.C. Sanders 14136 (UCR).*

Juniperus osteosperma **(Torrey) Little** - Utah Juniper. Common, rocky slopes and base of cliffs, 1000-2000 m. *B.A. Stein 108 (RSA).*

Pinaceae (Pine Family)

Pinus monophylla **Torrey & Fremont** - Singleleaf Pinyon Pine. Common, dominant in upper canyons, north-facing slopes and ridgetops, 1200-2100 m. *C.B. Wolf 10144 (RSA).*

DIVISION III. GNETOPHYTA (Gnetophytes)

Ephedraceae (Ephedra Family)

Ephedra aspera **S. Watson** - Boundary Ephedra. Uncommon, gravelly bajadas on lower slopes, western portion of range, 800-1200 m. *B.A. Stein 30 (RSA).*

Ephedra californica **S. Watson** - Desert Tea. Frequent, sandy bajadas and banks of washes, eastern portion of range, 1000-1400 m. *J. André 5064 (GMDRC).*

Ephedra nevadensis **S. Watson** - Nevada Tea. Common, gravelly bajadas and south-facing slopes, 800-1600 m. *J. André 3861 (RSA).*

Ephedra viridis **Cov.** - Green Ephedra. Common, rocky slopes and ridgetops in pinyon-juniper woodland, 900-2100 m. *R.F. Thorne 45476 (RSA).*

DIVISION IV. MAGNOLIOPHYTA (Flowering Plants)
CLASS I. DICOTYLEDONEAE – Dicotyledons

Amaranthaceae (Amaranth Family)

!Amaranthus albus **L.** - White Amaranth, Tumbleweed. Infrequent weed, eradicated from Granite Cove, occasional ruderal along Kelbaker Rd. *A.C. Sanders 10207 (UCR).*

!Amaranthus blitoides **S. Watson** - Mat Amaranth. Infrequent weed, disturbed areas in Granite Cove and along Kelbaker Rd. *B. Pitzer 4029 (UCR).*

Amaranthus fimbriatus **(Torrey) Benth.** - Fringed Amaranth. Common summer annual, sandy bajadas from 600-1300 m. *J. André 4805 (GMDRC).*

Anacardiaceae (Sumac Family)

Rhus trilobata **Torrey & A. Gray** - Skunkbush, Lemonade Berry. Frequent, canyon bottoms and brushy north-facing slopes, 900-2100 m. *J. André 2079 (GMDRC).*

Apiaceae (Carrot Family)

Cymopterus panamintensis **Coulter & Rose var.** *acutifolius* **(J. Coulter & Rose) Munz** - Panamint Indian Parsnip. Rare, only in Budweiser Wash. *John F. Emmel 546 (RSA).*

Lomatium nevadense **(S. Watson) J. Coulter & Rose var.** *nevadense* - Nevada Lomatium. Infrequent, north-facing slopes and ridgetops in pinyon-juniper woodland, 1400-2100 m. *J. André 4097 (GMDRC).*

Lomatium parryi **(S. Watson) J.F. Macbr.** - Parry's Lomatium. Uncommon, canyon bottoms and north-facing slopes near Granite Peak, 1500-2100. *J. André 3945 (RSA).*

Apocynaceae (Dogbane Family)

Amsonia tomentosa **Torrey & Fremont** - Woolly Amsonia. Rare, known only from the upper bajada at base of Bull Canyon, 900 m. *J. André 3677 (RSA).*

+*Nerium oleander* **L.** - Oleander. Historic cultivars in Granite Cove. *(obs. J. André 1994).*

Asclepiadaceae (Milkweed Family)

Asclepias erosa **Torrey** - Desert Milkweed. Frequent, in sandy washes and along roadsides, 900-1400 m. *B. Pitzer 4065 (UCR).*

Asclepias subulata **Decne.** - Rush Milkweed. Rare, in sandy washes and along Kelbaker Rd, below 1100 m. *J. André 3140 (GMDRC).*

Sarcostemma cynanchoides **Decne. ssp.** *hartwegii* **(Vail) R. Holm** - Climbing Milkweed. Rare, only from Willow Springs Basin,1100 m. *B.A. Stein 67 (UCSC).*

Sarcostemma hirtellum **(A. Gray) R. Holm** - Trailing Townula. Occasional, lower alluvial pavements and in sandy washes, 600-1200 m. *B.A. Prigge 2802 (UCR).*

Asteraceae (Sunflower Family)

Acamptopappus sphaerocephalus **(A. Gray) A. Gray var.** *hirtellus* **S.F. Blake** - Hairy Goldenhead. Common, sandy alluvial fans, 900-1400 m. *B. Pitzer 177 (UCR).*

Adenophyllum cooperi **(A. Gray) Strother** - Cooper's Dyssodia. Frequent, washes and on sandy bajadas, 600-1300 m. *J. André 3890 (GMDRC).*

Adenophyllum porophylloides **(A. Gray) Strother** - San Felipe Dyssodia. Infrequent, dry rocky hillsides, washes and canyons, 800-1600 m. *J. Douglas Ripley 1918a (UC).*

Ageratina herbacea* **(A. Gray) R. King & H. Rob. - Fragrant Snakeroot. Rare, one locality in crevice of granite boulders, Cottonwood Basin, 1800 m. *(obs., B.A. Stein 1978).*

!Ambrosia artemisifolia L. - Common Ragweed. Rare waif, in only one locality along Kelbaker Rd near Kelso Dunes. *J. André 4009 (GMDRC).*

Ambrosia dumosa **(A. Gray) Payne** - Burro-weed. Common, dominant of bajadas, pediment plains and flats throughout the area below 1500 m. *K. Hart 29 (GMDRC).*

Ambrosia eriocentra **(A. Gray) Payne** - Woolly Bur-sage. Frequent, in sandy washes and dry gullies, below 1500 m. *B. Pitzer 3905 (UCR).*

Amphipappus fremontii **Torrey & A. Gray var.** ***spinosus*** **(Nelson) C.L. Porter** - Fremont's Chaff-bush. Infrequent, rocky slopes below 1300 m. *F. Warrick 66 (GMDRC).*

Anisocoma acaulis **Torrey & A. Gray** - Scalebud. Locally common, sandy slopes near Kelso Dunes, and in washes on south side of range, below 1200 m. *J. André 4919 (GMDRC).*

Artemisia dracunculus **L.** - Tarragon. Infrequent, canyon bottoms and sandy washes or seeps at base of boulders, 1300-1600 m. *B. Pitzer 4060 (UCR).*

Artemisia ludoviciana **Nutt. ssp.** ***albula*** **(Wooton) Keck** - White Wormwood. Common, in dry sandy soils, bouldery slopes and canyons, below 1800 m. *B. Pitzer 4018 (UCR).*

Artemisia ludoviciana **Nutt. ssp.** ***incompta*** **(Nutt.) Keck** - Silver Wormwood. Rare, occurring only in Cottonwood Basin on rocky north-facing slope at 1500 m. *K. Hart 41(GMDRC).*

Artemisia tridentata **Nutt. ssp.** ***parishii*** **(A. Gray) H.M. Hall & Clements** - Parish's Sagebrush. Frequent, high ridges and slopes near Granite Pk, 1400-2100 m. *K. Hart 70 (GMDRC).*

Atrichoseris platyphylla **A. Gray** - Gravel-ghost. Occasional, lower slopes and washes on northwest side of range, below 1000 m. *B.A. Prigge 2826 (UC).*

Baccharis brachyphylla **A. Gray** - Short-leaved Baccharis. Rare, unconfirmed report from Willow Spring Basin *(obs., B.A. Stein 1978).*

Baccharis salicifolia **(Ruiz & Pav.) Pers.** - Mule Fat. Rare, Willow Springs Basin in canyon bottom, 1400 m. *(obs., J. André 1998).*

Baccharis sergiloides **A. Gray** - Desert Baccharis. Frequent, gravelly or sandy washes, canyon riparian corridors, below 1600 m. *B. Pitzer 4049 (UCR).*

Baileya pleniradiata **A. Gray** - Woolly Marigold. Infrequent, sandy slopes and aeolian deposits from Granite Pass to near Kelso Dunes. *G. Dilworth 25 (UC).*

Bebbia juncea **(Benth.) E. Greene var.** ***aspera*** **E. Greene** - Sweetbush. Locally common, washes and rocky canyon bottoms below 1200 m. *B.A. Prigge 2808 (UC).*

Brickellia arguta **Robinson var.** ***arguta*** - Spear-leaved Brickellia. Frequent, on granitic cliffs and in crevices in boulders, below 1400 m. *J. André 3741 (GMDRC).*

Brickellia californica **(Torrey & A. Gray) A. Gray** - California Brickellia. Common, rocky dry slopes among boulders, 1100-2000 m. *B.A. Stein 133 (UC).*

Brickellia desertorum **Cov.** - Desert Brickellia. Occasional, on rocky slopes and canyons in Sheep Corral, Willow Springs Basin and Budweiser Cyn, 800-1400 m. *B. Pitzer 4047 (UCR).*

Brickellia incana **A. Gray** - Woolly Brickellia. Occasional, large sandy washes and flats below 1100 m. *B. Pitzer 3946 (UCR).*

***Brickellia oblongifolia* Nutt. var. *linifolia* (D. Eaton) Robinson** - Narrow-leaved Brickellia. Frequent, dry slopes in canyons, 1300-2000 m. *J. André 3820 (GMDRC).*

***Calycoseris parryi* A. Gray** - Yellow Tack-stem. Infrequent, dry slopes and ridges in gravelly soils, mostly on western half of range, 1100-1800 m. *J. André 4094 (GMDRC).*

Chaenactis carphoclinia* A. Gray var. *carphoclinia - Pebble Pincushion. Locally common, lower elevations on alluvial fans and flats, below 1200 m. *G. Dilworth 34 (UC).*

***Chaenactis fremontii* A. Gray** - Fremont's Pincushion. Common, sandy bajadas and washes below 1600 m. *J.R. Haller 1589 (UCSB).*

***Chaenactis macrantha* D. Eaton** - Mojave Pincushion. Uncommon, only from dry ridges on west end of range at elevations of 1200-1500 m. *(obs. B.A. Stein 1978).*

***Chaenactis stevioides* Hook. & Arn.** - Desert Pincushion. Frequent on lower slopes and open sandy flats, below 1500 m. *G.L. Clifton 24411 (GMDRC).*

***Chrysothamnus depressus* Nutt.** - Long-flowered Rabbitbrush. Infrequent, rocky crevices and ridges above 1400 m. *J. André 3818 (UCR).*

***Chrysothamnus paniculatus* A. Gray** - Black-stem. Infrequent, sandy or gravelly washes at lower elevations, below 1200 m. *B.A. Stein 160 (GMCRC).*

***Chrysothamnus teretifolius* (Durand & Hilg.) H.M. Hall** - Needle-leaved Rabbitbrush. Uncommon, rocky slopes below 1400 m. *J. André 4010 (GMDRC).*

***Cirsium neomexicanum* A. Gray** - Desert Thistle. Occasional, canyons and dry rocky slopes, scattered throughout range, 800-2100 m. *J. André 4065 (GMDRC).*

***Conyza canadensis* (L.) Cronq.** - Horseweed. Rare, from one locality in upper Granite Cove, in moist seep below boulders *(obs, J. André 2001).*

***Dicoria canescens* A. Gray** - Desert Dicoria. Locally common, in aeolian sand on lower bajadas of the north side of range, below 800 m. *J. André 4282 (GMDRC).*

***Encelia actoni* Elmer** - Acton Encelia. Infrequent, rocky slopes and open areas, Granite Pass to Kelso Dunes, 800-1500 m. *J. André 3874 (GMDRC).*

***Encelia farinosa* Torrey & A. Gray** - Brittlebush, Incienso. Locally common, dry stony and gravelly slopes, below 1200 m. *B.A. Prigge 2804 (UC).*

***Encelia frutescens* (A. Gray) A. Gray** - Bush Encelia. Frequent, locally dominant in sandy washes and alluvial fans in mixed scrub, below 1200 m. *B. Pitzer 3879 (UCR).*

***Encelia virginensis* Nelson** - Virgin River Encelia. Occasional, gravelly alluvial fans and rocky slopes, more common on east side of range, below 1500 m. *B. Pitzer 3886 (UCR).*

Ericameria cooperi* (A. Gray) H.M. Hall var. *cooperi - Goldenbush. Common, gravelly bajadas in diverse mixed scrub, 900-1500 m. *J. André 3694 (GMDRC).*

***Ericameria cuneata* (A. Gray) McClatchie var. *spathulata* (A. Gray) H.M. Hall** - Cuneate-leaved Ericameria. Common, rocky crevices, 1000-2100 m. *R.F. Thorne 50640 (UC).*

***Ericameria laricifolia* (A. Gray) Shinn.** - Turpentine-brush. Occasional, rocky canyons and slopes, pinyon-juniper woodland, mixed scrub, 1000-2100 m. *R.F. Thorne 53841 (UC).*

Ericameria linearifolia **(DC.) Urb. & J. Wussow** - Interior Goldenbush. Common, upper bajadas and lower rocky slopes in mixed scrub, 1100-2100 m. *J. Evens 43 (GMDRC).*

Erigeron breweri **A. Gray var. *porphyreticus* (M.E. Jones) Cronq.** - Brewer's Daisy. Occasional, canyons and washes, east side of range, 1300-1600 m. *K. Hart 69 (GMDRC).*

Erigeron concinnus **(Hook. & Arn.) Torrey & A. Gray var. *concinnus*** - Navajo Fleabane. Frequent, sandy to rocky slopes, crevices, 1200-2000 m. *J. André 4168 (GMDRC).*

Erigeron divergens **Torrey & A. Gray** - Diffuse Daisy. Occasional, slopes and sandy bajadas, sporatically distributed, 1200-2000 m. *J. Evens 50 (GMDRC).*

Eriophyllum lanosum **(A. Gray) A. Gray** - White-flowered Woolly Daisy. Infrequent, between Granite Cove and Kelso Dunes, 600-1300 m. *J. André 3665 (GMDRC).*

Eriophyllum pringlei **A. Gray** - Pringle's Woolly Daisy. Infrequent, lower slopes and flats on south side of range, 900-1200 m. *J. André 5062 (GMDRC).*

Eriophyllum wallacei **(A. Gray) A. Gray** - Wallace's Woolly Daisy. Common, sandy washes, bajadas, open ridges, 700-2100 m. *B. Pitzer 3913 (UCR).*

Filago californica **Nutt.** - California Filago. Frequent, canyon bottoms, rocky slopes and crevices, 1000-2000 m. *J. André 3948 (RSA).*

Filago depressa **A. Gray** - Dwarf Filago. Uncommon, sandy washes and alluvial fans, lower slopes on northwest side of range below 1000 m. *B.A.Prigge 2582 (UC).*

Geraea canescens **A. Gray** - Desert Sunflower. Uncommon, sandy washes and aeolian deposits near Kelso Dunes, below 1000 m. *B.A. Prigge 2555 (UCR).*

Glyptopleura marginata **D. Eaton** - Carved-seed. Uncommon, sandy flats and ridges, northwest side of range below 1500 m. *F. Vasek 1 (UCR).*

Gnaphalium palustre **Nutt.** - Lowland Cudweed. Uncommon, moist seeps and spring areas, Cottowood Basin, Bighorn Basin and Bull Cyn., 1300-2000 m. *A.C. Sanders 14145 (UCR).*

Gnaphalium stramineum **Kunth** - Chilean Cudweed. Uncommon, moist seeps and banks of canyon watercourses, 1200-1600 m. *B. Pitzer 4002 (UCR).*

Gutierrezia microcephala **(DC.) A. Gray** - Sticky Snakeweed. Common, washes, sandy flats and disturbed areas, 1200-2000 m. *B. Pitzer 3880 (UCR).*

Gutierrezia sarothrae **(Pursh.) Britton & Rusby** - Matchweed. Infrequent, grasslands, valley bottoms and ridges, 1300-2100 m. *E.J. Lawlor 170 (UCR).*

Hymenoclea salsola **A. Gray var. *pentalepis* (Rydb.) L. Benson** - Five-scaled Burrobush. Common, washes and sandy flats 700-1500 m. *F. Warrick 94 (GMDRC).*

Hymenoclea salsola **A. Gray var. *salsola*** - Burrobush, Cheesebush. Common, canyons, washes and slopes 700-1600 m. *J. Evens 38 (GMDRC).*

Layia glandulosa **(Hook.) Hook. & Arn.** - White Tidy-tips. Occasional, sandy bajadas and aeolian deposits near Kelso Dunes, 700-1800 m. *J. André 4813 (GMDRC).*

Machaeranthera canescens **(Pursh.) A. Gray var. *leucanthemifolia* (E. Greene) B. Turner** - Hoary Aster. Uncommon, sands near Kelso Dunes, 800 m. *J. André 5902 (GMDRC).*

Malacothrix coulteri **A. Gray** - Snake's-head. Infrequent, lower bajadas on south and west sides of range, 900-1100 m. *J. André 5773 (GMDRC).*

Malacothrix glabrata **A. Gray** - Desert Dandelion. Common, sandy bajadas, open desert scrub, 700-1400 m. *B.A. Stein 11 (GMDRC).*

***Malacothrix stebbinsii* W. Davis & Raven** - Stebbins' Desert Dandelion. Uncommon, gravelly soils beneath shrubs, Willow Springs Basin, 1200-1400 m. *W.L. Jepson 20500 (JEPS).*

***Monoptilon bellidiforme* A. Gray** - Desert Star. Uncommon, sandy washes, mouth of Cottonwood and lower Playground Wash, 800-1300 m. *F. Warrick 11 (GMDRC).*

***Monoptilon bellioides* (A. Gray) Hall** - Mojave Desert Star. Occasional, gravelly or stony washes and depressions, 700-1300 m. *J. André 3989 (GMDRC).*

***Nicolletia occidentalis* A.** Gray - Nicolletia. Uncommon, washes and sandy flats, only from lower Willow Springs Wash on south side of range, 1000 m. *J. André 5065 (GMDRC).*

Palafoxia arida* B. Turner & M. Morris** var. ***arida - Spanish-needle. Occasional, sandy washes and aeolian deposits, 700-1200 m. *J. André 4627 (GMDRC).*

Pectis papposa* Harvey & A. Gray var. *papposa Chinch-weed. Locally common summer annual, sandy or gravelly bajadas and flats, 700-1400 m. *T. Tennant 122 (GMDRC).*

***Perityle emoryi* Torrey** - Emory Rock-daisy. Occasional, crevices and rocky substrates at lower elevations; mainly southwest side of range, 800-1100 m. *F. Warrick 5 (GMDRC).*

***Pleurocoronis pluriseta* (A. Gray) R. King & H. Robinson** - Arrow-leaf. Infrequent, crevices and rocky substrates at lower elevations, 800-1100 m. *J. André 3894 (GMDRC).*

***Pluchea sericea* (Nutt.) Cov.** - Arrow-weed. Rare, subsaline soils associated with sidehill seep, Budweiser Cyn, 1450 m. *J. André 5722 (GMDRC).*

***Porophyllum gracile* Benth.** - Odora. Occasional, gravelly washes and hills, dry rocky slopes, below 1300 m. *F. Warrick 98 (GMDRC).*

***Prenanthella exigua* (A. Gray) Rydb.** - Egbertia. Rare, known only from dry rocky canyons on west side of range, below 1500 m. *J. André 5683 (GMDRC).*

***Psilostrophe cooperi* (A. Gray) E. Greene** - Paper-daisy. Infrequent, lower slopes on north side of range below 1400 m. *B.A. Stein s.n. (UCSC).*

***Rafinesquia californica* Nutt.** - California Chicory. Uncommon, known only from gravelly slopes in Willow Spring Basin, 1400-1600 m. *B.A. Stein s.n. (UCSC).*

***Rafinesquia neomexicana* A. Gray** - Desert Chicory. Occasional, sandy or gravelly washes, bajadas and slopes, 800-1900 m. *B.A. Stein 19 (GMDRC).*

***Senecio flaccidus* Less. var. *monoensis* (E. Greene) Turner & Barkley** - Shrubby Butterweed. Frequent, canyon bottoms and washes, 900-1500 m. *K. Hart 30 (GMDRC).*

***Senecio multilobatus* A. Gray** - Basin Butterweed. Uncommon, rocky or gravelly slopes and ridges, northeastern corner of range, 1400-1800 m. *B.A. Stein 65 (GMDRC).*

***Solidago confinis* A. Gray** - Southern Goldenrod. Infrequent, seeps and springs, understory of woodland, 1300-1800 m. *J. André 5639 (GMDRC).*

!***Sonchus asper* (L.) Hill ssp. *asper*** - Prickly Sow-thistle. Rare, only from lower Budweiser Cyn, in moist seeps, 1200 m. *J. André 4085 (GMDRC).*

!***Sonchus oleraceus* L.** - Common Sow-thistle. Uncommon, moist canyon bottoms and seeps, known from only three localities, 1200-1800 m. *J. André 4048 (GMDRC).*

Stephanomeria exigua* Nutt. ssp. *exigua - Small Stephanomeria. Frequent, sandy bajadas and banks of washes, 700-1500 m. *J. André 4091 (GMDRC).*

Stephanomeria parryi **A. Gray** - Parry's Stephanomeria. Infrequent, widely scattered occurrences, gravelly bajadas and ridges, 1200-1600 m. *F. Warrick 82 (GMDRC).*

Stephanomeria pauciflora **(Nutt.) Nelson var. *pauciflora*** - Wire-lettuce. Occasional, sandy washes and aeolian deposits near Kelso Dunes, 700-1300 m. *K. Hart 54 (GMDRC).*

Stylocline micropoides **A. Gray** - Desert Neststraw. Infrequent, dry rocky slopes, lower elevations, 700-1400 m. *J. André 3731 (GMDRC).*

Syntrichopappus fremontii **A. Gray** - Yellow Syntrichopappus. Infrequent, washes and sandy slopes, mostly on eastern end of range, 1300-1800 m. G.L. *Clifton 34459 (GMDRC).*

******Tetradymia argyraea*** **Munz & Roos** - Striped Horsebrush. Infrequent, high ridges and rocky slopes in openings of pinyon woodland, above 1500 m. *J. André 3937 (GMDRC).*

Tetradymia stenolepis **E. Greene** - Mojave Horsebrush. Frequent, plateaus and upper bajadas in enriched woody and succulent scrub 1200-1900 m. *J. André 5628 (GMDRC).*

Trichoptilium incisum **A. Gray** - Yellow-head. Infrequent, dry open bajadas and gravelly flats on west side of range below 1000 m. *B.A. Stein 93 (GMDRC).*

Trixis californica **Kellogg var. *californica*** - California Trixis. Uncommon, rocky pediments, west side of range near base of Budweiser Wash, 800 m. *J. Evens 68 (GMDRC).*

Uropappus lindleyi **(DC.) Nutt.** - Silver Puffs. Occasional, widely scattered in sandy bajadas and understory of pinyon and juniper woodland, 1000-2000 m. *J. André 4921 (UCR).*

Viguiera parishii **E. Greene** - Parish's Viguiera. Frequent, dry rocky canyons and slopes, lower elevations, below 1500 m. *J. André 3696 (GMDRC).*

Xylorhiza tortifolia **(Torrey and A. Gray) E. Greene var. *tortifolia*** - Mojave Aster. Frequent, gravelly bajadas in diverse shrub associations, below 1400 m. *J. André 5067 (GMDRC).*

Berberidaceae (Barberry Family)

Berberis fremontii* **Torrey - Fremont's Barberry. Rare, rocky slopes, only near summit of E. Fork Willow Springs Cyn, 1600 m. *C.B. Wolf 10148 (RSA).*

Bignoniaceae (Bignonia Family)

Chilopsis linearis **(Cav.) Sweet ssp. *arcuata*** **(Fosb.) Henrickson** - Desert Willow. Occasional, large washes at lower elevations below 1300 m. B. Pitzer 3941 (UCR).

Boraginaceae (Borage Family)

Amsinckia menziesii **(Lehm.) Nelson & J.F. Macbr. var. *intermedia*** **Fischer & C. Meyer** - Rancher's fireweed. Occasional, gravelly bajadas and slopes, 1000-2000 m. *J. André 4131 (GMDRC).*

Amsinckia tessellata* A. Gray var. *tessellata - Fiddleneck. Common, sandy bajadas and flats, south-facing slopes throughout the range, 700-1500 m. *F. Warrick 2 (GMDRC).*

***Cryptantha angustifolia* (Torrey) & E. Greene** - Narrow-leaved Cryptantha. Common, sandy washes and bajadas, gravelly open slopes, 700-1500 m. *B. Pitzer 3911 (UCR).*

***Cryptantha barbigera* (A. Gray) E. Greene** - Bearded Cryptantha. Locally common, gravelly bajadas, rocky slopes and washes, usually below 1300 m. *J. André 3750 (GMDRC).*

***Crypthanta circumscissa* (Hook & Arn.) I.M. Johnston** - Greeneocharis. Frequent, sandy washes and flats throughout, below 1400 m. *J. André 2110 (GMCR).*

***Cryptantha decipiens* (M.E. Jones) A.A. Heller** - Gravel Cryptantha. Uncommon, rocky slopes and understory of boulders and woodlands, 1100-2100 m. *J. André 3960 (RSA).*

***Cryptantha dumetorum* (E. Greene) E. Greene** - Bush-loving Cryptantha. Uncommon, sandy bajadas (often twining through *Ambrosia*), below 1100 m. *J. André 3958 (GMDRC).*

***Cryptantha gracilis* Osterh.** - Slender Cryptantha. Occasional, ridgetops and in understory of pinyon-juniper woodland, 1400-2100 m. *J. André 4167 (GMDRC).*

***Cryptantha maritima* (E. Greene) E. Greene** - Guadalupe Cryptantha. Infrequent, rocky outcrops and gravelly slopes at lower elevations, 800-1200 m. *J. André 3956 (GMDRC).*

***Cryptantha micrantha* (Torrey) Johnston** - Eremocarya. Occasional, sandy washes and aeolian deposits near Kelso Dunes, 700-1300 m. *J. André 3863 (GMDRC).*

***Cryptantha nevadensis* Nelson & Kenn.** - Nevada Crytantha. Occasional, sandy or gravelly bajadas, washes (under shrubs), rocky hillsides, 800-1800 m. *J. André 5903 (GMDRC).*

***Cryptantha pterocarya* (Torrey) E. Greene** - Wing-nut Cryptantha. Common, sandy and gravelly bajadas surrounding range, 700-1300 m. *C.L. Clifton 35111 (GMDRC).*

***Cryptantha racemosa* (S. Watson) E. Greene** - Bushy Cryptantha. Uncommon, rocky crevices and dry gravelly slopes, Willow Springs Basin, 1100-1300 m. *J. André 3959 (GMDRC).*

***Cryptantha utahensis* (A. Gray) E. Greene** - Scented Cryptantha. Occasional, gravelly or rocky slopes, into pinyon-juniper woodland, 1000-1900 m. *J. André 4029 (GMDRC).*

***Pectocarya heterocarpa* (I.M. Johnston) I.M. Johnston** - Chuckwalla Pectocarya. Frequent, dry sandy bajadas in openings among shrubs, below 1500 m. *G.L. Clifton 24408 (GMDRC).*

***Pectocarya penicillata* (Hook. & Arn.) A. DC.** - Bristled Pectocarya. Disturbed areas, flats, mainly eastern side of range, 900-1500 m. *B.A. Prigge 2860 (UCR).*

***Pectocarya platycarpa* Munz & I.M. Johnston** - Broad-fruited Pectocarya. Frequent, washes and sandy bajadas, 700-1400 m. *J. André 3895 (GMDRC).*

***Pectocarya recurvata* I.M. Johnston** - Recurved Pectocarya. Occasional, gravelly bajadas, shelter of rocks, 800-1600m. *J. André 3949 (GMDRC).*

***Pectocarya setosa* A. Gray** - Bristly Pectocarya. Frequent, sometimes dominant understory of shrubs on gravelly bajadas, 800-1800 m. *G.L. Clifton 25113 (GMDRC).*

Plagiobothrys arizonicus **(A. Gray) A. Gray** - Arizona Popcorn Flower. Locally common, sandy bajadas and washes, 900-1900 m. *J. André 4918 (GMDRC).*

Tiquilia plicata **(Torrey) A. Richardson** - Plicate-leaved Tiquilia. Sandy areas, roadsides and aeolian deposits near Kelso Dunes, below 1200 m. *J. André 4202 (GMDRC).*

Brassicaceae (Mustard Family)

Arabis glaucovalvula **M.E. Jones** - Blue-podded Rock-cress. Rare, rocky summits and slopes, usually metamorphic substrates, 1000-1300 m. *B.A. Stein s.n. (UCSC).*

Arabis perennans **S. Watson** - Perennial Rock-cress. Occasional, canyon walls, gravelly slopes, understory of pinyon or juniper woodland, 1200-2100 m. *G.L. Clifton 24608 (GMDRC).*

Arabis pulchra **M.E. Jones var. *gracilis* M.E. Jones** - Beautiful Rock-cress. Occasional, shaded microsites on rocky or gravelly slopes, 1000-2100 m. *J. André 4169 (GMDRC).*

Athysanus pusillus **(Hook.) E. Greene** - Athysanus. Rare, grassy openings among pinyon, mouth of Cottonwood Basin, 1300 m. *G.L. Clifton 31578 (GMDRC).*

!***Capsella bursa-pastoris*** **(L.) Medikus** - Shepard's Purse. Rare waif, maintenance yard in Granite Cove; since extirpated. *R. Norris s.n. (GMDRC).*

!***Brassica tournefortii*** **Gouan** - Tournefort's Mustard. Occasional, rapidly invading roadsides and sandy bajadas below 1400 m. First obs. in flora 1995. *J. André 3643 (GMDRC).*

Caulanthus cooperi **(S. Watson) Payson** - Cooper's Caulanthus. Infrequent, open sandy or gravelly bajadas or gentle slopes, 1000-2100. *B.A. Prigge s.n. (UCR).*

Descurainia pinnata **(Walter) Britton ssp. *glabra* (Wooton & Standley) Delt.** - Western Tansy Mustard. Frequent, bajadas and flats, 800-1500 m. *J. André 3900 (GMDRC).*

Descurainia pinnata **(Walter) Britton ssp. *halictorum* (Cockerell) Detl.** - Tansy Mustard. Infrequent, sandy or gravelly washes and flats, 1000-1400 m. *J. André 2834 (GMDRC).*

!***Descurainia sophia*** **(L.) Webb** - Eurasian Tansy Mustard. Uncommon, disturbed sites, roadsides, sandy areas near Kelso Dunes. *K. Hart 47 (GMDRC).*

Dithyrea californica **Harvey** - California Spectacle-pod. Uncommon, sandy banks of washes, aeolian deposits near Kelso Dunes, 700-1300 m. *J. André 3951 (GMDRC).*

Draba cuneifolia **Torrey & A. Gray** - Sonora Draba. Occasional, shaded crevices in rocks and gravelly slopes, 1200-2100 m. *J. André 3673 (GMDRC).*

Guillenia lasiophylla **(Hook. & Arn.) E. Greene** - California Mustard. Occasional, sandy bajadas and flats, below 1300 m. *J. Evens 93 (GMDRC).*

!***Hirschfeldia incana*** **(L.) Lagr.-Fossat** - Mediterranean Mustard. Uncommon, disturbed areas in Granite Cove and Cottonwood Basin, 1300-1400 m. *J. André 3829 (GMDRC).*

Hutchinsia procumbens **(L.) Desv.** - Hutchinsia. Rare, moist shady sites near seeps or understory of woodland, east side of range, 1100-1400 m. *G.L. Clifton 25026 (GMDRC).*

***Lepidium densiflorum* Schrader var. *elongatum* (Rydb.) Thell.** - Dense-flowered Lepidium. Rare, sandy canyon drainages, Willow Spring Basin, 1500 m. *J. André 3987 (GMDRC).*

Lepidium fremontii* Wats. var. *fremontii - Fremont's Pepper-grass. Occasional, sandy bajadas and flats below 1300 m. *J. André 3867 (GMDRC).*

Lepidium lasiocarpum* Torrey & A. Gray var. *lasiocarpum - Hairy Pod Pepper-grass. Frequent, open sites on slopes and bajadas, 900-2000 m. *J. André 3138 (GMDRC).*

!***Sisymbrium irio* L.** - London Rocket. Uncommon, disturbed areas along roadsides and developments, 800-1400 m. *B. Pitzer 4033 (UCR).*

Stanleya pinnata* (Pursh.) Britton var. *pinnata - Golden Prince's Plume. Infrequent, associated with subalkaline soils near seeps, 1200-1500 m. *J. André 3857 (GMDRC).*

***Streptanthella longirostris* (S. Watson) Rydb.** - Small Streptanthella. Frequent, sandy bajadas and aeolian deposits near Kelso Dunes, 700-1200 m. *J. André 4215 (GMDRC).*

***Thysanocarpus curvipes* Hook.** - Narrow-leaved Fringe-pod. Occasional, gentle slopes and moist understory of woodland, 1000-1600 m. *G.L. Clifton 25101 (GMDRC).*

***Thysanocarpus laciniatus* Torrey & A. Gray** - Hairy Fringe-pod. Occasional, gravelly bajadas and rocky slopes, 1200-1800 m. *G.L. Clifton 15029 (GMDRC).*

Cactaceae (Cactus Family)

***Cylindropuntia acanthocarpa* (Engelm. & J. Bigelow) F.M. Knuth var. *coloradensis* Benson** - Buckhorn Cholla. Common, gravelly bajadas, 900-1500 m. *A.C. Sanders 5820 (UCR).*

***Cylindropuntia echinocarpa* (Engelm. & J. Bigelow) F.M Knuth** - Silver Cholla. Frequent, sandy bajadas and dry flats, below 1400 m. *J. André 6277 (GMDRC).*

***Cylindropuntia ramosissima* (Engelm.) F.M. Knuth** - Pencil Cholla. Common, gravelly bajadas in diverse mixed scrub associations, below 1400 m. *B. Pitzer 4150 (UCR).*

Echinocactus polycephalus* Engelm. & J. Bigelow var. *polycephalus - Clustered Barrel Cactus. Uncommon, rocky hills and silty flats below 1100 m. *J André 5910 (GMDRC).*

***Echinocereus engelmanii* (Engelm.) Lemaire** - Engleman's Hedgehog Cactus. Frequent, dry rocky and gravelly slopes, 1000-2000 m. *J. André 5802 (GMDRC).*

***Echinocereus triglochidiatus* Engelm.** - Mojave Mound Cactus. Occasional, gravelly bajadas or slopes, usually in diverse shrub associations, 1000-2100 m. *C.B. Wolf 10172 (RSA).*

***Ferocactus cylindraceus* (Engelm.) Orcutt** - Leconte's California Barrel Cactus. Occasional, rocky or gravelly slopes or upper bajadas, 900-1500 m. *J. André 5523 (GMDRC).*

***Mammillaria tetrancistra* Engelm.** - Spiny Fishhook Cactus. Infrequent, rocky pediments, slopes, gravelly bajadas, 900-1500 m. *J. André 5960 (GMDRC).*

Opuntia basilaris* Engelm. & J. Bigelow var. *basilaris - Beavertail. Frequent, gravelly bajadas, washes, pinyon-juniper woodland, 800-1900 m. *J. André 5526 (GMDRC).*

Opuntia chlorotica **Engelm. & J. Bigelow** - Pancake Prickly-pear. Occasional, bouldery slopes and rocky canyon walls, 1100-1600 m. *J. André 5776 (GMDRC).*

Opuntia phaeacantha **Engelm.** - Mojave Tuna. Infrequent, ridgetops and gravelly slopes, understory of pinyon-juniper woodland, 1000-1800 m. *J. André 6188 (GMDRC).*

Opuntia polycantha **Haworth var.** *erinacea* **(Engelm. & J. Bigelow) B.D. Parfitt** - Mojave Prickly-pear. Frequent, ridgetops and rocky slopes, 1300-2100 m. *(obs. J. André 1994).*

Campanulaceae (Bellflower Family)

Nemacladus glanduliferus **Jepson var.** *orientalis* **McVaugh** - Glandular Nemacladus. Uncommon, sandy bajadas and washes, below 1600 m. *J. André 3980 (GMDRC).*

Nemacladus rubescens **E. Greene** - Desert Nemacladus. Uncommon, dry washes and slopes in sand or gravel, below 1500 m. *J. André 5083 (UCR).*

Nemacladus sigmoideus **G. Robb.** - Small-flowered Nemacladus. Rare, sandy or gravelly soils, especially near Kelso Dunes, 700-1200 m. *W.L. Jepson 20509 (JEPS).*

Capparaceae (Caper Family)

Isomeris arborea **(Nutt.)** - Bladderpod. Occasional, in sandy washes and flats, mainly eastern side of range below 1300 m. *M. Lopez 2 (GMDRC).*

Caryophyllaceae (Pink Family)

Achyronychia cooperi **Torry & A. Gray** - Onyx Flower. Infrequent, sandy slopes, washes, flats, below 1300 m. *F. Warrick 22 (GMDRC).*

Arenaria macradenia **Watson var.** *macradenia* - Desert Sandwort. Occasional, dry rocky slopes, ridges and understory of woodland, 1200-2100 m. *J. Evens 29 (GMDRC).*

Silene antirrhina **L.** - Snapdragon Catchfly. Uncommon, rocky or bouldery slopes in pinyon-juniper woodland, mainly east side of range, 1300-1800 m. *K. Hart 25 (RSA).*

Silene verecunda **S. Watson ssp.** *andersonii* **(Clokey) C. Hitchc. & Maguire** - Dolores Campion. Uncommon, open sites in woodland, 1400-2000 m. *J. André 3946 (GMDRC).*

Chenopodiaceae (Goosefoot Family)

Atriplex canescens **(Pursh.) Nutt. ssp.** *canescens* - Fourwing Saltbush. Uncommon, canyon bottoms or near seeps, 1300-1800 m. *J. André 3897 (GMDRC).*

Atriplex polycarpa **(Torrey) S. Watson** - All-scale. Uncommon, sandy soil at lower elevations on west (and southeast) side of range, below 1000 m. *B Pitzer 4053 (UCR).*

Chenopodium fremontii **S. Watson** - Fremont's goosefoot. Uncommon, shaded sites, usually understory of woodland or in disturbed areas, 1000-1700 m. *A.C. Sanders 10206 (UCR).*

!***Chenopodium murale*** **L.** - Wall Goosefoot. Rare waif, disturbed soils, Sheep Corral and Granite Cove (extirpated from both sites in 2001). *J. Evens 100 (GMDRC).*

Grayia spinosa **(Hook.) Moq.** - Hopsage. Frequent, sandy or gravelly bajadas in diverse mixed scrub associations, 1100-1500 m. *K. Hart 15 (GMDRC).*

Krascheninnikovia lanata **(Pursh.) A.D.J. Meeuse & Smit** - Winter Fat. Infrequent, bajadas with diverse mixed scrub, mainly south side along I-40, 1000-1500 m. *J. André 4090 (GMDRC).*

!***Salsola tragus*** **L.** - Russian Thistle. Uncommon, disturbed sites in Granite Cove (extirpated 1996), roadsides, and sandy soils near Kelso Dunes, below 1300 m. *(obs. J. André 1996).*

Convolvulaceae (Morning Glory Family)

!***Convolvulus arvensis*** **L.** - Bindweed. Rare waif, along Kelbaker Road., disturbed road shoulders, 1100 m. *J. André 4152 (GMDRC).*

Crassulaceae (Stonecrop Family)

Dudleya pulverulenta **(Nutt.) Britton & Rose ssp.** ***arizonica*** **(Rose & Moran)** - Arizona Dudleya. Uncommon, rock crevices, 1200-1500 m. *J. André 4089 (GMDRC).*

Dudleya saxosa **(M.E. Jones) Britton & Rose ssp.** ***aloides*** **(Rose) Moran** - Banner Dudleya. Frequent, rocky slopes, among boulders, 1200-2000 m. *J. André 3688 (GMDRC).*

Cucurbitaceae (Gourd Family)

Cucurbita palmata **S. Watson** - Coyote Melon. Infrequent, roadsides, sandy washes and flats, 700-1400 m. *B. Pitzer 4052 (UCR).*

Cuscutaceae (Dodder Family)

Cuscuta californica **Hook. & Arn. var.** ***californica*** - California Dodder. Occasional, sandy bajadas or washes, growing on shrubs, below 1400 m. *J. André 4574 (GMDRC).*

Ericaceae (Heath Family)

Arctostaphylos **nova sp.** (undergoing taxonomic study) - Manzanita. Very rare, known from one occurrence on ridge south of Cottonwood Basin, 1700 m. *J. André 4052 (GMDRC).*

Euphorbiaceae (Spurge Family)

Chamaesyce albomarginata **(Torrey & A. Gray) Small** - Rattlesnake Weed. Frequent, sandy bajadas and flats, below 1400 m. *F. Warrick 21 (GMDRC).*

Chamaesyce micromera **(Engelm.) Wooton & Standley** - Desert Spurge. Frequent summer annual, sandy soils, below 1200 m. *R.F. Thorne 50664 (RSA).*

***Chamaesyce polycarpa* (Benth.) Millsp.** - Big Spurge. Locally common, washes, flats, sandy slopes, below 1600 m. *J. André 4631 (GMDRC).*

Chamaesyce serpyllifolia* (Pers.) Small ssp. *serpyllifolia - Thyme-leaved Spurge. Occasional, gravelly bajadas, 1000-1800 m. *R.F. Thorne 50678 (RSA).*

***Chamaesyce setiloba* (Torrey) Parish** - Yuma Spurge. Frequent, sandy flats and bajadas, below 1500 m. *R.F. Thorne 50662 (RSA).*

***Croton californicus* Muell. Arg.** - California Croton. Uncommon, aeolian sand deposits on lower alluvial fans near Kelso Dunes, below 800 m. *R.F. Thorne 51235 (RSA).*

!***Eremocarpus setigerus* (Hook.) Benth.** - Turkey Mullein. Rare waif, growing on shoulder of Kelbaker Road near Granite Pass *(obs. J. André 2002).*

***Euphorbia incisa* Engelm.** - Mojave Spurge. Frequent, rock crevices and bouldery slopes, especially on eastern half of range, 1200-2000 m. *J. André 2126 (GMDRC).*

***Stillingia linearifolia* Wats.** - Linear-leaved Stillingia. Occasional, gravelly slopes and washes, below 1400 m. *J. André 3743 (GMDRC).*

Fabaceae (Pea Family)

***Acacia greggii* A. Gray** - Catclaw Acacia. Locally common, dynamic washes, canyon bottoms, rocky slopes and crevices in cliffs, 700-1800 m. *B.A. Stein 112 (GMDRC).*

***Astragalus acutirostris* S. Watson** - Beaked Rattleweed. Occasional, open gravelly pediments and slopes, 1000-1500 m. *R.F. Thorne 51550 (RSA).*

Astragalus didymocarpus* Hook. & Arn. var. *didymocarpus - Two-seeded Milkvetch. Locally common, gravelly slopes at lower elevations, below 1300 m. *J. André 3947 (GMDRC).*

***Astragalus didymocarpus* Hook. & Arn. var. *dispermus* (A. Gray) Jepson** - Desert Dwarf Milkvetch. Uncommon, gravelly bajadas below 1200 m. *C.B. Wolf 10129 (RSA).*

***Astragalus layneae* E. Greene** - Layne's Rattleweed. Occasional, roadsides, dry slopes and washes, mostly east side of range, 1000-2000 m. *J. André 3990 (GMDRC).*

*****Astragalus lentiginosus* Hook. var. *borreganus* M.E. Jones** - Borrego Milkvetch. Rare, aeolian deposits near Kelso Dunes 800 m. *G.L. Clifton 36627 (GMDRC).*

***Astragalus lentiginosus* Hook. var. *fremontii* A. Gray & Wats.** - Fremont's Freckled Milkvetch. Common, sandy bajadas and washes below 1600 m. *J. André 2123 (GMDRC).*

Astragalus mohavensis* S. Watson var. *mohavensis - Mojave Rattleweed. Occasional, dry rocky slopes, 1200-1900 m. *B.A. Prigge 2327 (RSA).*

***Astragalus nutans* M.E. Jones** - Providence Mountain Milkvetch. Uncommon, canyon bottoms, gravelly slopes and ridges, 1400-2000 m. *A. C. Sanders 14134 (UCR).*

***Astragalus nuttallianus* A. DC. var. *imperfectus* (Rydb.) Barneby** - Nuttall's Milkvetch. Occasional, dry stony or gravelly slopes, 900-2000 m. *C.B. Wolf 10130 (RSA).*

***Astragalus purshii* Hook. var. *tinctus* M.E. Jones** - Sheep-pod. Infrequent, canyon washes and open grassy slopes, 1300-1900 m. *G.L. Clifton 15031 (GMDRC).*

+***Caesalpinia gilliesii* (Wall ex. Hook.) Benth.** - Bird of Paradise. Rare, planted at "Dorners" cabin, east side of range, 1300 m. *(obs. J. André 1994).* Note: not naturalizing into wild.

Dalea mollissima **(Rydb.) Munz** - Downy Dalea. Infrequent, gravelly bajadas and washes, below 1100 m. *B.A. Prigge 2580 (UCR).*

Lotus humistratus **E. Greene** - Short-podded Lotus. Infrequent, rocky slopes and gravelly bajadas, below 1500 m. *J. André 5099 (GMDRC).*

Lotus rigidus **(Benth.) E. Greene** - Desert Lotus. Frequent, rocky and gravelly slopes, mostly eastern side of range, 1000-1800 m. *B.A. Prigge 2858 (UCR).*

Lotus strigosus **(Nutt.) E Greene** - Strigose Lotus. Locally common, sandy and gravelly bajadas and gentle slopes, 800-1500 m. *B. Pitzer 3941(UCR).*

Lupinus arizonicus **(S. Watson) S. Watson** - Arizona Lupine. Occasional, washes and roadsides, mainly on east side of range, 900-1200 m. *J. André 5966 (GMDRC).*

Lupinus concinnus **J. Agardh**. - Bajada Lupine. Frequent, sandy, gravelly washes, alluvial fans, below 1500 m. *G.L. Clifton 24788 (GMRC).*

Lupinus microcarpus **Sims var.** ***microcarpus*** - Chick Lupine. Uncommon, sandy or disturbed areas, once seeded along Kelbaker Rd, 1000-1400 m. *A.C. Sanders 14147 (UCR).*

Lupinus shockleyi **S. Watson** - Shockley's Lupine. Uncommon, aeolian deposits in lower alluvial fans near Kelso Dunes, below 1000 m. *Steve Boyd 1 (UCR).*

Lupinus sparsiflorus **Benth**. - Coulter's Lupine. Occasional, washes on east side of range, and aeolian deposits near Kelso Dunes, below 1300 m. *J. André 5101 (UCR).*

Prosopis glandulosa **Torrey var.** ***torreyana*** **(L. Benson) M. Johnston** - Honey Mesquite. Infrequent, canyon bottoms, seeps and springs, 1200-1700 m. *J. André 5777 (GMDRC).*

Psorothamnus arborescens **(A. Gray) Barneby var.** ***minutifolius*** **Parish) Barneby** - Johnson's Indigo Bush. Occasional, gravelly areas below 1400 m. *J. André 3866 (RSA).*

Psorothamnus spinosus **(A. Gray) Barneby** - Smoke Tree. Uncommon, washes near Kelso Dunes, and along Kelbaker Rd. near I-40, 600-1200 m. *(obs. J. André 1998).*

+***Robinia pseudoacacia*** **L.** - Black locust. Rare, planted near residence in Granite Cove, 1350 m. *(obs. J. André 1994).*

Senna armata **(S. Watson) H. Irwin & Barneby** - Spiny Senna. Common, sandy or gravelly bajadas and flats, 800-1500 m. *B. Pitzer 3792 (UCR).*

Fagaceae (Oak Family)

Quercus chrysolepis **Liebm.** - Canyon Live Oak. Infrequent, canyons and bouldery slopes, mostly east side of range, above 1300 m. *R.F. Thorne 45420 (UCD).*

Garryaceae (Silk Tassel Family)

Garrya flavescens **S. Watson** - Ashy Silk-tassel. Infrequent, canyons near springs, bouldery slopes above 1400 m. *Peggy Ledyard s.n. (UCR).*

Gentianaceae (Gentian Family)

Centaurium exaltatum **(Griseb.) Piper** - Alkaline Centaury. Rare, seeps and springs in wet sod, Coyote Spring, Willow Springs Basin, 1100-1500 m. *J. André 4177 (GMDRC).*

Geraniaceae (Geranium Family)

!*Erodium cicutarium* **(L.) Aiton** - Red-stemmed Filaree. Common, sandy washes and bajadas, sometimes dominant ground cover, below 1600 m. *B. Pitzer 3887 (UCR).*

Erodium texanum **A. Gray** - Mojave Filaree. Uncommon, gravelly flats and pavement surfaces at lower elevations, 800-1100 m. *J. André 3661 (GMDRC).*

Grossulariaceae (Gooseberry Family)

Ribes velutinum **E. Greene** - Plateau Gooseberry. Uncommon, shaded sites among boulders or understory of pinyon and oak woodland, 1500-2100 m. *J. André 3940 (GMDRC).*

Hydrophyllaceae (Waterleaf Family)

Emmenanthe penduliflora **Benth. var.** *penduliflora* - Yellow-flowered Whispering Bells. Uncommon, rocky or gravelly slopes, 1100-1600 m. *J. André 4199 (GMDRC).*

Eriodictyon angustifolium* **Nutt. - Narrow-leaved Yerba Santa. Uncommon, gravelly slopes and ridges, east side of range only, 1400-1800 m. *J. Evens s.n. (UCR).*

Eucrypta chrysanthemifolia **(Benth.) E. Greene var.** *bipinnatifida* **(Torrey) Constance** - Small-flowered Eucrypta. Occasional, rock crevices and gravelly slopes, 900-1600 m. *J. André 2105 (GMDRC).*

Eucrypta micrantha **(Torrey) A.A. Heller** - Desert Eucrypta. Infrequent, rock crevices and slopes, lower elevations (mainly west side), below 1100 m. *F. Warrick 23 (GMDRC).*

Nama demissum **A. Gray var.** *demissum* - Purple Mat. Occasional, washes and sandy flats, especially near Kelso Dunes, 700-1300 m. *G.L. Clifton 34190 (GMDRC).*

Nemophila menziesii **Hook. & Arn. var.** *integrifolia* **Parish** - Southern Baby Blue-eyes. Occasional, rocky or gravelly slopes, 1300-2000 m. *G.L. Clifton 24457 (GMDRC).*

Phacelia affinis **A. Gray** - Purple-bell Phacelia. Uncommon, boulders and rock crevices, gravelly slopes 1300-1800 m. *S. Fahl 1 (GMDRC).*

Phacelia campanularia **A. Gray ssp.** *vasiformis* **Gillett** - Desert Blue-bells. Occasional, rocky slopes and washes, especially eastern half of range, 1100-1700 m. *B. Pitzer 3966 (UCR).*

Phacelia crenulata **Torrey var.** *ambigua* **(M.E. Jones) J.F. Macbr.** - Crenulate-leaved Phacelia. Common, gravelly bajadas below 1500 m. *G.L. Clifton 33727 (GMDRC).*

Phacelia cryptantha **E. Greene** - Limestone Phacelia. Infrequent, steep gravelly slopes and among boulders, especially west side of range, 1000-1800 m. *J. André 4098 (GMDRC).*

***Phacelia curvipes* Wats.** - Washoe Phacelia. Uncommon, shaded slopes and canyon washes, mainly east side of range, 1200-1500 m. *K. Hart 56 (GMDRC).*

***Phacelia distans* Benth.** - Common Phacelia. Common, sandy or gravelly bajadas or ridge tops in mixed shrub associations, below 1700 m. *J. André 3759 (GMDRC).*

***Phacelia fremontii* Torrey** - Fremont's Phacelia. Locally common, sandy or gravelly bajadas, 1000-2000 m. *F.C. Vasek 6 (UCR).*

***Phacelia ivesiana* Torrey** - Ives' Phacelia. Uncommon, aeolian sand deposits near Kelso Dunes, below 900 m. *J. André 4207 (GMDRC)*

***Phacelia lemmonii* A. Gray** - Lemmon's Phacelia. Uncommon, washes and canyon bottoms in damp soils, 1100-1500 m. *J. André 4158 (GMDRC).*

***Phacelia pachyphylla* A. Gray** - Thick-leaf Phacelia. Rare, on banks of washes; only Bull Canyon Wash near Kelso Dunes, 900 m. *R. F. Thorne 51152 (UC).*

***Phacelia pedicellata* A. Gray** - Pedicelled Phacelia. Uncommon, among rocks and banks of drainages, below 1200 m. *B.A. Prigge 2838 (UCR).*

***Phacelia rotundifolia* A. Gray** - Round-leaf Phacelia. Infrequent, rock crevices, cliff faces, steep gravelly slopes, 800-1600 m. *B.A. Prigge 2836 (UCR).*

***Phacelia vallis-mortae* J. Voss** - Death Valley Phacelia. Rare, limestone gravels on Silver Peak and upper Bull Canyon, 1800-2000 m. *R.F. Thorne 51615 (UC).*

***Pholistoma membranaceum* (Benth.) Constance** - White Fiesta-flower. Occasional, gravelly slopes in diverse scrub, mostly east side, 1100-1600 m. *J. André 3973 (GMDRC).*

Krameriaceae (Rhatany Family)

***Krameria erecta* Rose & Painter** - Pima Rhatany. Common, sandy and gravelly bajadas and gentle slopes in diverse shrub associations, 800-1500 m. *B.A. Stein 69 (GMDRC).*

***Krameria grayi* Schultes** - White Rhatany. Occasional, sandy and gravelly bajadas and sandy flats at lower elevations, 800-1300 m. *B.A. Prigge 2797 (UCR).*

Lamiaceae (Mint Family)

***Mentha arvensis* L.** - Mint. Rare, growing in moist shade of willows at Twin Springs, east side of range, 1200 m. *J. André 4571 (GMDRC).*

Monardella linoides* A. Gray ssp. *linoides - Flax-leaved Monardella. Occasional, bouldery slopes in pinyon and juniper woodland, 1000-2100 m. *B. Pitzer 4013 (UCR).*

***Salazaria mexicana* Torrey** - Bladder Sage. Frequent, sandy washes, bajadas and flats, sometimes as a dominant, 1000-1500 m. *J. André 5068 (GMDRC).*

***Salvia columbariae* Benth.** - Chia. Frequent, sandy washes, flats and bajadas, 800-1600 m. *R.F. Thorne 45463 (RSA).*

Salvia dorrii* (Kellogg) Abrams var. *dorrii - Purple Sage. Common, sandy or gravelly washes, bajadas and slopes, 800-1900 m. *W. Wisura 4361 (RSA).*

***Salvia dorrii* (Kellogg) Abrams var. *pilosa* (A. Gray) J.L. Strachan & Rev.** – Hairy Sage. Uncommon, slopes and washes, 1000-1800 m. *K. Hart 2 (RSA).*

Salvia mohavensis **E. Greene** - Mojave Sage. Occasional, rocky or gravelly slopes or understory of pinyon and juniper woodland, 1300-2100 m. *A.C. Sanders 5823 (UCR).*

Salvia pachyphylla **Munz** - Rose Sage. Uncommon, washes and gravelly slopes in shaded areas, Cottonwood Basin and Granite Peak, 1600-2100 m. *J. André 3941 (RSA).*

Lennoaceae (Lennoa Family)

Pholisma arenarium Hook. – Pholisma. Infrequent, sandy washes and flats, especially near Kelso Dunes, 800-1300 m. *J. André 5181 (GMDRC).*

Linaceae (Flax Family)

Linum lewisii **Pursh.** - Desert Yellow Flax. Rare, ridgetops near summit, and near Cottonwood Basin (obs. *J. André 2000);* locality of 1930 collection by M.E. Jones s.n. (UC) is vague.

Loasaceae (Loasa Family)

Mentzelia albicaulis **Hook.** - White-stemmed Mentzelia. Frequent, gravelly bajadas and gentle slopes, 900-1600 m. *G.L. Clifton 30421 (GMDRC).*

Mentzelia involucrata **Wats.** - White-bracted Mentzelia. Uncommon, dry gravelly slopes, northwest side of range, 1400-1700 m. *B.A. Stein 7 (GMDRC).*

Mentzelia obscura **H.J. Thompson & Joyce Roberts** - Obscure Mentzelia. Rarely collected, known from bajadas on east side of range, 1100-1200 m. *J. Evens 105 (GMDRC).*

Mentzelia veatchiana **Kellogg** - Veatch's Blazingstar. Uncommon. Sandy soils, 700-1400 m. *B.A. Prigge 2782 (UCLA).*

Petalonyx thurberi **A. Gray var. *thurberi*** - Common Sandpaper Plant. Occasional, broad sandy washes near Kelso Dunes and east side of range, 700-1400 m. *J. André 2111 (GMDRC).*

Malvaceae (Mallow Family)

Eremalche exilis **(A. Gray) E. Greene** - White Mallow. Uncommon, sandy washes and flats, 1000-1400, mainly south side of range. *J. André 5821 (GMDRC).*

Eremalche rotundifolia **(A. Gray) E. Greene** - Desert Five-spot. Infrequent, gravelly flats and washes, below 1200 m. *B.A. Stein 4 (GMDRC).*

Sphaeralcea ambigua **A. Gray var. *ambigua*** - Apricot Mallow. Frequent, sandy or gravelly slopes and alluvial fans throughout area, 700-1800 m. *J. André 3856 (GMDRC).*

Meliaceae (Mahogany Family)

+***Melia azedarach*** L. - China Berry. Rare horticultural planting in Granite Cove (has not naturalized), 1300 m. *(obs. J. André 1994).*

Molluginaceae (Carpet-weed Family)

!***Mollugo cerviana*** **(L.) Ser.** - Indian Chickweed. Occasional summer annual, sandy or gravelly bajadas, below 1500 m. *B.A. Prigge 2329 (UCR).*

Nyctaginaceae (Four O'Clock Family)

Abronia villosa **S. Watson var. *villosa*** - Sand Verbena. Uncommon, sandy bajadas with aeolian sand deposits near Kelso Dunes, below 900 m. *J. André 4203 (GMCRC).*

Allionia incarnata **L.** - Windmills. Occasional, sandy washes, gentle slopes, especially west side of range, below 1500 m. *B.A. Prigge 2579 (UCR).*

Boerhavia triquetra **S. Watson** - Slender Boerhavia. Occasional, sandy bajadas in diverse mixed scrub, east side of range, 1100-1400 m. *J. André 4807 (UCR).*

Boerhavia wrightii **A. Gray** - Wright's Boerhavia. Uncommon, sandy areas along banks of washes, and near Kelso Dunes, 700-1300 m. *J. André 6458 (GMDRC).*

Mirabilis bigelovii **A. Gray var. *bigelovii*** - Desert Four-o'clock. Frequent, gravelly bajadas in mixed scrub, gentle slopes and ridgetops, 900-1800 m. *F. Warrick 101 (GMDRC).*

Mirabilis bigelovii **A. Gray var. *retrorsa* (A.A. Heller) Munz** - Reflexed-haired Four-o'clock. Uncommon, gravelly or rocky slopes, 1200-1600 m. *B.A. Stein 12 (RSA).*

Oleaceae (Olive Family)

Forestiera pubescens **Nutt.** - Desert Olive. Uncommon, moist sandy soils in canyon drainages, Cottowood and Bull Cyns, 1400-1700 m. *F. Warrick 92 (GMDRC).*

Menodora scoparia **A. Gray** - Broom-twinberry. Uncommon, dry rocky slopes and gravelly ridgetops, 1500-2000 m. *(obs. J. André 2001, above Cove Spring).*

Menodora spinescens **A. Gray** - Spiny Menodora. Common, gravelly alluvial fans in diverse mixed scrub associations, 1100-2100 m. *J. André 4920 (UCR).*

Onagraceae (Evening Primrose Family)

Camissonia boothii **(Douglas) Raven ssp. *condensata* (Munz) Raven** - Booth's Evening Primrose. Occassional, sandy areas near Kelso Dunes, below 1200 m. *J. André 3991 (GMDRC).*

Camissonia boothii **(Douglas) Raven ssp. *intermedia* (Munz) Raven** - Intermediate Evening Primrose. Rare, Budweiser Wash, west side of range, 1600 m. *K. Hart 52 (UCSC).*

Camissonia brevipes **(A. Gray) Raven var. *brevipes*** - Desert Primrose. Occasional, gravelly slopes and alluvial fans, below 1500 m (more common below 1000 m). *K. Hart 1 (RSA).*

Camissonia californica **(Torrey & A. Gray) Raven** - California Primrose. Infrequent, rocky or gravelly slopes, metamorphic substrates, below 1300 m. *J. André 3660 (GMDRC).*

Camissonia chamaenerioides **(A. Gray) Raven** - Willow-herb Primrose. Infrequent, gravelly washes and bajadas, below 1500 m. *J. André 3752 (GMDRC).*

***Camissonia claviformis* (Torrey & Fremont) Raven ssp. *aurantiaca* (Munz) Raven** - Strigose Clavate-fruited Primrose. Frequent, sandy areas, 700-1100 m. *B.A. Prigge 2666 (UCR).*

Camissonia claviformis* (Torrey & Fremont) ssp. *claviformis - Clavate-fruited Primrose. Rare, bajada below Willow Springs Basin, 1200-1300 m. *W.L. Jepson 20420 (JEPS).*

Camissonia pallida* (Abrams) Raven ssp. *pallida - Pallid Evening Primrose. Frequent, dry slopes, washes and flats, 1000-1800 m. *J. André 3753 (GMDRC).*

***Camissonia refracta* (S. Watson) Raven** - Refracted Desert Primrose. Frequent, sandy washes and flats, below 1300 m. *J. André 3697 (GMDRC).*

***Camissonia walkeri* (Nelson) Raven ssp. *tortilis* (Jepson) Raven** - Walker's Primrose. Rare, unconfirmed report at Granite Pass. *B.A. Stein s.n., in 1978 (UCSC).*

***Epilobium canum* (E. Greene) Raven ssp. *latifolium* (Hook.) Raven** - California Fuchsia. Infrequent, moist sand in seeps, cyn bottoms, 1200-1900 m. *J.P. Donahue 76214 (RSA).*

Epilobium ciliatum* Raf. ssp. *ciliatum - Willow Herb. Rare, moist seeps, east side of range, Cottonwood Basin, Coyote Spring, 1200-1300 m. *J. André 3888 (GMDRC).*

***Oenothera caespitosa* Nutt. ssp. *marginata* (Hook. & Arn.) Munz** - Caespitose Evening Primrose. Infrequent, sandy washes and roadsides, 900-1600 m. *K. Hart 12 (RSA).*

***Oenothera californica* (S. Watson) S. Watson ssp. *avita* Klein** - Pinnate California Evening Primrose. Rare, along road in Cottonwood Basin, 1400 m. *B.A. Stein 108 (GMDRC).*

Oenothera deltoides* Torrey & Fremont ssp. *deltoides - Devil's Lantern. Occasional, sandy benches near Kelso Dunes, 700-800 m. *J. André 4206 (GMDRC).*

***Oenothera longissima* Rydb.** - Long Evening Primrose. Rare, seasonally moist areas in canyon bottoms and near seeps, upper Granite Cove, 1400 m. *Norris s.n. (GMDRC).*

***Oenothera primiveris* A. Gray ssp. *bufonis* (M.E. Jones) Munz** - Yellow Desert Evening Primrose. Rare, gravelly bajada near Coyote Spring, 1100 m. *J. André 5881 (GMDRC).*

Orobanchaceae (Broom-Rape Family)

***Orobanche cooperi* (A. Gray) A.A. Heller** - Cooper's Broomrape. Uncommon, sandy washes and flats, below 1000 m. *B.A. Prigge 2595 (UCR).*

Orobanche parishii* (Jepson) Heckard ssp. *parishii - Parish's Broomrape. Rare, gravelly bajadas in diverse scrub, 1300 m. (near the "Bunny Club"). *B. Pitzer 3968 (UCR).*

Papaveraceae (Poppy Family)

***Eschscholzia glyptosperma* E. Greene** - Mojave Poppy. Uncommon, washes, dry slopes and pavements, mainly west side of range, below 1000 m. *J. Evens 11 (GMDRC).*

***Eschscholzia minutiflora* S. Watson** - Pygmy Poppy. Frequent, washes, flats and sandy bajadas, 700-1700 m. *J. André 3704 (GMDRC).*

Plantaginaceae (Plantain Family)

Plantago ovata **Forsskal** - Island Plantain. Common, gravelly slopes and bajadas, often a dominant ground cover, 800-1500 m. *J. André 2134 (GMDRC).*

Plantago patagonica **Jacq.** - Pursh's Plantain. Rare, coarse rocky bajada near Cove Spring, also on sandy soils near Kelso Dunes, 800-1300 m. *K. Hart 17 (GMDRC).*

Polemoniaceae (Phlox Family)

Aliciella hutchinsifolia **(Rydb.) J.M. Porter** - Southern Great Basin Gilia. Uncommon, sandy or gravelly slopes and washes, below 1400 m. *Norris s.n. (GMDRC).*

Aliciella latifolia **(S. Watson) J.M. Porter ssp.** ***latifolia*** - Broad-leaved Gilia. Uncommon, sandy or gravelly flats or pavements, west side, below 1200 m. *B.A. Prigge 2739 (UCR).*

Aliciella leptomeria **(A. Gray) J.M. Porter** - Great Basin Gilia. Uncommon, sandy washes and flats, near Kelso Dunes, below 900 m. *J. André 5097 (UCR).*

Eriastrum diffusum **(A. Gray) H. Mason** - Diffuse Eriastrum. Infrequent, sandy flats and alluvial fans, aeolian deposits near Kelso Dunes, 700-1100 m. *R.F Thorne 51246 (RSA).*

Eriastrum eremicum **(Jepson) H. Mason ssp.** ***eremicum*** - Desert Eriastrum. Frequent, sandy and gravelly bajadas and washes, 900-1800 m. *J. André 3689 (GMDRC).*

Eriastrum sparsiflorum **(Eastw.) H. Mason** - Few-flowered Eriastrum. Infrequent, dry slopes and ridgetops above 1700 m. *J. André 5771 (GMDRC).*

Gilia aliquanta **A.D. Grant & V. Grant ssp.** ***aliquanta*** - Puckered Gilia. Uncommon, gravelly slopes and bajadas, mainly east side of range, 1000-1300 m. *J. André 4929 (GMDRC).*

Gilia aliquanta **A.D. Grant & V. Grant ssp.** ***breviloba*** **A.D. Grant & V. Grant** - Puff-calyx Gilia. Occasional, gravelly slopes and bajadas, 900-1400 m. *J. André 4911 (UCR).*

Gilia cana **(M.E. Jones) A.A. Heller ssp.** ***triceps*** **(Brand) A.D. Grant & V. Grant** - Hoary Gilia. Uncommon, sandy flats on north side, below 1300 m. *J. André 3808 (GMDRC).*

Gilia latiflora **(A. Gray) A. Gray ssp.** ***latiflora*** - Broad-flowered Gilia. Infrequent, sandy areas, especially near Kelso Dunes, below 1000 m. *J. André 5093 (UCR).*

Gilia malior **A.G. Day & V. Grant** - Decumbent Gilia. Uncommon, sandy or gravelly bajadas on northeast side of range, below 1300 m. *J. André 4927 (GMDRC).*

Gilia ochroleuca **M.E. Jones ssp.** ***ochroleuca*** - Desert Gilia. Occasional, sandy soils on slopes and bajadas, 700-1500 m. *G.L. Clifton 21852 (GMDRC).*

Gilia ophthalmoides **Brand** - Desert Mountain Gilia. Occasional, rocky slopes in pinyon-juniper woodland, 1300-2100 m. *C.W. Tilford 983 (RSA).*

Gilia scopulorum **M.E. Jones** - Rock Gilia. Occasional, washes, sandy areas on shaded slopes in rocky canyons, 1000-1400 m. *G.L. Clifton 24408 (GMDRC).*

Gilia sinuata **Benth.** - Sinuate Gilia. Frequent, open sandy flats and bajadas, especially on north and east sides of range, 700-1400 m. *J. André 4926 (UCR).*

Gilia splendens **H. Mason & A.D. Grant ssp.** ***splendens*** - Splendid Gilia. Rare, on east-facing slope in pinyon woodland, Cottonwood Basin, 1500 m. *B.A. Stein 42 (UCSC).*

Gilia stellata **A.A. Heller** - Star Gilia. Frequent, sandy bajadas and washes, especially near Kelso Dunes, 700-1300 m. *J. André 4913 (UCR).*

Gilia transmontana **H. Mason & A.D. Grant** - Northern Desert Gilia. Occasional, gravelly or sandy bajadas, open ridgetops, mostly east side, 800-1800 m. *J. André 4928 (GMDRC).*

Langloisia setosissima **(Torrey & A. Gray) E. Greene ssp.** ***punctata*** **(Cov.) S. Timbrook** - Spotted Langloisia. Uncommon, flats near Kelso Dunes, 800 m. *F. Warrick 8 (RSA).*

Leptosiphon aureus **(Nutt.) J.M. Porter & L.A. Johnson ssp.** ***aureus*** - Desert Gold. Rare, unconfirmed reports from northwest side of range on dry flats below 900 m.

Leptosiphon aureus **(Nutt.) J.M. Porter & L.A. Johnson ssp.** ***decorus*** **(A. Gray) J.M. Porter & L.A. Johnson** - Cream Gilia. Frequent, gravelly bajadas below 2000 m. *H.J. Thompson 3620 (RSA).*

Linanthus bigelovii **(A. Gray) E. Greene** - Bigelow's Linanthus. Occasional, dry rocky slopes in canyons, mostly southeast side of range, 1400-1900 m. *W.L. Jepson 20415 (JEPS).*

Linanthus demissus **(A. Gray) E. Greene** - Desert Linanthus. Occasional, gravelly flats and ridgetops, sandy washes, 800-1900 m. *W.L. Jepson 20503 (JEPS).*

Linanthus filiformis **(A. Gray) J.M. Porter & L.A. Johnson** - Thread-stemmed Gilia. Infrequent, rocky slopes or washes, northwest side, 900-1500 m. *B. Prigge 2830 (UCR).*

Linanthus jonesii **(A. Gray) E. Greene** - Jones' Linanthus. Uncommon, sandy flats and washes, west side of range at elevations below 900 m. *B.A. Prigge 2584 (UCR).*

Linanthus pungens **(Torrey) J.M. Porter & L.A. Johnson.** - Granite Gilia. Occasional, rocky or bouldery slopes in pinyon-juniper woodland, 1500-2100 m. *K. Hart 72 (GMDRC).*

Loeseliastrum matthewsii **(A. Gray) S. Timbrook** - Desert Calico. Occasional, sandy or gravelly alluvial slopes and flats, below 1500 m. *B.A. Prigge 2801 (UCR).*

Loeseliastrum schottii **(Torrey) S. Timbrook** - Schott's Desert Calico. Occasional, washes, bajadas and slopes in sandy to gravelly soils, 900-1800 m. *J. André 4210 (GMDRC).*

Phlox stansburyi **(Torrey) A.A. Heller** - Stansbury's Phlox. Infrequent, shaded rocky or gravelly slopes and ridgetops, mostly Bull Canyon, 1600-2100 m. *B.A. Stein 74 (GMDRC).*

Saltugila australis **(H. Mason & A.D. Grant) L.A. Johnson** - Southern Gilia. Uncommon, sandy washes and flats, only from south side at 1100-1200 m. *C.B. Wolf 10057 (UC).*

Polygonaceae (Buckwheat Family)

Centrostegia thurberi **A. Gray** - Thurber's Spine-flower. Infrequent, gravelly flats and gentle bajadas, mostly on south side of range, 900-1300 m. *B.A. Prigge 2785 (UCR).*

Chorizanthe brevicornu **Torrey var.** ***brevicornu*** - Brittle Chorizanthe. Occasional, gravelly bajadas and rocky slopes, 800-1500 m. *R.F. Thorne 51116 (RSA).*

Chorizanthe rigida **(Torrey) Torrey & A. Gray** - Rigid Chorizanthe. Occasional, pavements and open gravelly flats, mostly lower slopes below 1000 m. *J. André 3891 (GMDRC).*

***Chorizanthe watsonii* Torrey & A. Gray** - Watson's Chorizanthe. Uncommon, sandy or gravelly bajadas in mixed scrub, 1000-1400 m. *G.L. Clifton 24321 (GMDRC).*

***Eriogonum brachyanthum* Cov.** - Small Buckwheat. Rare, sandy soil of alluvial fan, only Willow Springs Basin, 1100 m. *H.J. Thompson 3635 (UCLA).*

***Eriogonum brachypodum* Torrey & A. Gray** - Short-flowered Buckwheat. Rare, on sandy flats near Kelso Dunes below Bull Canyon, 800 m. *B.A. Stein s.n. (UCSC).*

***Eriogonum davidsonii* E Greene** - Davidson's Buckwheat. Uncommon, bouldery slopes and ridges, east side of range (Cottonwood Basin) at 1400-1900 m. *B.A. Stein 45 (GMDRC).*

Eriogonum deflexum* Torrey var. *deflexum - Flat-topped Buckwheat. Frequent, along roadsides, washes, and gravelly bajadas, 900-1500 m. *J. André 4011 (GMDRC).*

***Eriogonum fasciculatum* (Benth.) Torrey & A. Gray ssp. *polifolium* (Benth.) Torrey & A. Gray** - Interior California Buckwheat. Common, gravelly bajadas and ridges, 900-2100 m. *K. Hart 50 (GMDRC).*

***Eriogonum heermannii* Durand & Hilg. var. *argense* (M.E. Jones) Munz** - Heerman's Buckwheat. Uncommon, rocky slopes, east side, above 1700 m. *(obs, J.André 1997).*

***Eriogonum heermanii* Durand & Hilg. var. *floccosum* Munz** - Clark Mtn. Buckwheat. Infrequent, bouldery slopes on east side of range, 1600-2100 m. *J.André 3942 (RSA).*

Eriogonum inflatum* Torrey & Fremont var. *inflatum - Desert Trumpet. Frequent, gravelly pediments and flats, and disturbed roadsides, 800-1400 m. *L. Gross 1734 (RSA).*

***Eriogonum maculatum* A.A. Heller** - Angle-stemmed Buckwheat. Infrequent, gravelly slopes and ridges, pinyon-juniper woodland, 1300-1900 m. *J. André 4095 (GMDRC).*

***Eriogonum nidularium* Cov.** - Idria Eriogonum. Frequent, open sandy areas in washes, flats, and gentle alluvial fans, 700-1800 m. *J. André 3754 (GMDRC).*

***Eriogonum palmerianum* Reveal** - Palmer's Buckwheat. Occasional, sandy or gravelly bajadas and ridges, 900-2100 m. *(obs J. André 2001).*

***Eriogonum panamintense* C. Morton** - Panamint Buckwheat. Rare, gravelly slopes and talus, Cottonwood Basin, 1400-1700 m. *B.A. Stein 120 (GMDRC).*

***Eriogonum plumatella* Durand & Hilg.** - Plumatella. Occasional, washes and sandy flats, also along roadsides, 1100-1400 m. *J. André 4806 (UCR).*

***Eriogonum pusillum* Torrey & A. Gray** - Puny Buckwheat. Frequent, washes and sandy flats, 1000-1700 m. *J. André 4982 (GMDRC).*

***Eriogonum reniforme* Torrey & Fremont** - Kidney-leaved Buckwheat. Uncommon, sandy washes (Willow Springs Wash), 900-1300 m. *B.A. Stein 49 (GMDRC).*

***Eriogonum thomasii* Torrey** - Thomas' Buckwheat. Uncommon, gravelly or rocky slopes and pediment plains, 800-1300 m. *B.A. Prigge 2556 (UCR).*

***Eriogonum trichopes* Torrey** - Yellow Trumpet. Infrequent, sandy or gravelly alluvial plains, usually high in clay, mostly north side of range, below 1300 m. *B.A. Prigge 2800 (UCR).*

***Eriogonum umbellatum* Torrey var. *subaridum* S. Stokes** - Sulphur-flowered Buckwheat. Occasional, among boulders in woodland, 1300-2100 m. *J. André 3938 (GMDRC).*

Eriogonum wrightii **Benth. var. *wrightii*** - Wright's Buckwheat. Common, dry gravelly slopes, among boulders, or understory of woodland, 1000-2100 m. *J. André 3824 (GMDRC).*

******Nemacaulis denudata*** **Nutt. var. *gracilis* Goodman & L. Benson** - Wooly-heads. Rare, aeolian sand deposits near Kelso Dunes, 800 m. *J. André 4195 (GMDRC).*

Oxytheca perfoliata **Torrey & A. Gray** - Perfoliate Oxytheca. Occasional, sandy or loose gravelly soils in mixed scrub associations, below 1500 m. *J. André 5632 (GMDRC).*

Pterostegia drymarioides **Fischer & C. Meyer** - Pterostegia. Occasional, moist rocky slopes in sandy soils, below 1500 m. *J. André 3672 (GMDRC).*

Rumex hymenosepalus **Torrey** - Canaigre. Infrequent, sandy soils in large washes or flats, especially near Kelso Dunes, 700-1300 m. *J. André 3889 (GMDRC).*

Portulacaceae (Purslane Family)

Calyptridium monandrum **Nutt.** - Common Calyptridium. Infrequent, sandy flats and washes, open sites among mixed scrub, 1000-1600 m. *B.A. Prigge 2805 (UCR).*

Claytonia parviflora **Hook.** ssp. ***parviflora*** - Miner's Lettuce. Occasional, vernally moist soils in shade of boulders or woodlands, 1200-2100 m. *J. André 3974 (GMDRC).*

Claytonia parviflora **Hook. ssp. *viridis* (Davidson) John M. Miller** - Linear-leaved Miner's Lettuce. Uncommon, in understory of woodland, 1400-1800 m. *G.L. Clifton 24370 (GMDRC).*

******Portulaca halimoides*** **L.** - Desert Purslane. Occasional to common following summer rain, sandy bajadas and washes, especially east side, 1000-1600 m. *S. Boyd 5174 (RSA).*

Portulaca **sp. (*retusa?*)** - possibly undescribed purslane resembling *P. oleracea*, or what has been called *P. retusa* in Arizona. Unlike *P. oleracea* in that plants have diminutive flowers and a ubiquitous distribution on bajadas in undisturbed native shrub associations, 1100-1400 m. *J. André 5914 (GMDRC).*

Ranunculaceae (Buttercup Family)

Anemone tuberosa **Rydb.** - Desert Anemone. Infrequent, rocky slopes and ledges, north side of range, 1200-1800 m. *F. Warrick 30 (GMDRC).*

Aquilegia formosa **Fischer** - Crimson Columbine. Rare, base of Bull Canyon growing in mossy banks of "Columbine Spring", 1700 m. *Norris s.n. (GMDRC).*

Delphinium parishii **A. Gray ssp. *parishii*** - Parish's Larkspur. Occasional, gravelly bajadas in diverse mixed scrub associations, 1000-1500 m. *J. André 6220 (GMDRC).*

Myosurus cupulatus **S. Watson** - Arizona Mouse-tail. Uncommon, moist seeps and shady slopes, pinyon-juniper woodland, 1100-1800 m. *G.L. Clifton 24458 (GMDRC).*

Resedaceae (Mignonette Family)

Oligomeris linifolia **(M. Vahl) J.F. Macbr.** - Oligomeris. Uncommon, gravelly benches and sandy flats near Kelso Dunes, below 900 m. *B.A. Prigge 2608 (UCR).*

Rhamnaceae (Buckthorn Family)

Rhamnus ilicifolia **Kellogg** - Holly-leaved Red-berry. Infrequent, bouldery slopes in pinyon-juniper woodland, 1200-2100 m. *J. André 3734 (GMDRC).*

Rosaceae (Rose Family)

Amelanchier utahensis **Koehne** - Utah Service Berry. Uncommon, moist north-facing bouldery slopes, Cottonwood Basin and Snake Spring, 1300-1600 m. *J. Evens 43 (GMDRC).*

Coleogyne ramosissima **Torrey** - Blackbush. Common, dominating upper bajadas and plateaus, 1000-2000 m. *J.André 3865 (GMDRC).*

Fallugia paradoxa **(D. Don) Endl.** - Apache Plume. Infrequent, banks of canyon drainages and among boulders, 1200-2100 m. *K. Hart 33 (GMDRC).*

Holodiscus microphyllus **Rydb. var.** ***microphyllus*** - Rock Spiraea. Infrequent, bouldery slopes in pinyon-juniper woodland, 1800-2100 m. *J. André 3943 (GMDRC).*

Ivesia saxosa **(E. Greene) B. Ertter** - Rock Cinquefoil. Uncommon, crevices in cliff faces and boulders, 900-2100 m. *J. André 3735 (GMDRC).*

Prunus fasciculata **(Torrey) A. Gray var.** ***fasciculata*** - Desert Almond. Locally common, washes, occasionally on slopes, 1000-2000 m. *J. André 2121 (GMDRC).*

Purshia tridentata **(Pursh.) DC. var.** ***glandulosa*** **(Curran) M.E. Jones** - Mojave Antelope Bush. Frequent, ridges and slopes in woodland, 1300-2100 m. *J. André 2102 (GMDRC).*

Rubiaceae (Madder Family)

!Galium aparine **L.** - Goose Grass. Rare, in shady areas around springs on east side of range 1200-1500 m. *J. Evens 98 (GMDRC).*

****Galium munzii*** **Hilend & J. Howell** - Munz's Bedstraw. Rare, cool north-facing canyon slopes, Cottonwood Basin, 1300-1600 m. *B.A. Stein 36 (RSA)*

Galium parishii **Hilend & J. Howell** - Parish's Bedstraw. Infrequent, steep rocky slopes and shady canyon bottoms, 1600-2100 m. *Bradbury 286 (UC).*

Galium stellatum **Kellogg var.** ***eremicum*** **Hilend & J. Howell** - Desert Bedstraw. Common, rocky slopes and shady canyon bottoms, 1000-2000 m. *J. André 3698 (GMDRC).*

Rutaceae (Rue Family)

Thamnosma montana **Torrey & Fremont** - Turpentine Bush. Common, gravelly bajadas in diverse shrub associations, 800-1400 m. *R.F. Thorne 45381 (UCR).*

Salicaceae (Willow Family)

Populus fremontii **S. Watson** ssp. *fremontii* - Fremont Cottonwood. Uncommon, from four localities: Cove and Cottonwood Springs, Bull and Willow Spr Cyns, 1300-1800 m. *R.F. Thorne 45471 (UC).*

Salix exigua **Nutt.** - Narrow-leaved Willow. Infrequent, clonal occurrences in deep canyon drainages and springs, 1100-1900 m. *J. André 2130 (GMDRC).*

Salix gooddingii **C. Ball** - Goodding's Black Willow. Rare, springs and seeps in canyons and on rocky slopes, 1200-1500 m. *R.F. Thorne 45421 (UC).*

Salix laevigata **Bebb** - Red Willow. Rare, moist north-facing slopes, Snake Spring (may be *S. gooddingii* mis-identified). *W.L. Jepson 20532 (JEPS)*

Salix lasiolepis **Benth.** - Arroyo Willow. Uncommon, rocky slopes associated with sidehill seeps, upper Granite Cove, 1600 m. *J. Evens 102 (GMDRC).*

Saururaceae (Lizard's-tail Family)

Anemopsis californica **(Nutt.) Hook & Arn.** - Yerba Mansa. Rare, reported from lower Bull Canyon, 1200 m. (photograph and leaf material verified by J. André 1999).

Scrophulariaceae (Figwort Family)

Antirrhinum filipes **A. Gray** -Yellow Twining Snapdragon. Occasional, on shrubs and debris, mostly in washes, below 1400 m. *J. André 3955 (GMDRC).*

Castilleja angustifolia **(Nutt.) G. Don** - Desert Indian Paintbrush. Occasional, upper bajadas in mixed scrub, or wooded slopes, 1200-2000 m. *G.L. Clifton 24411 (GMDRC).*

Castilleja linariifolia **Benth.** - Linear-leaved Paintbrush. Infrequent, gravelly bajadas, washes and rocky slopes, 1000-2100 m. *B. Pitzer 4020 (UCR).*

Keckiella antirrhinoides **(Benth.) Straw var.** *microphylla* **(A. Gray) N. Holmgren** - Desert Chaparral Beard-tongue. Infrequent, bouldery slopes, pinyon-juniper woodland, 1200-1900 m. R.F. Thorne 45443 (UC).

Mimulus bigelovii **(A. Gray) A. Gray var.** *bigelovii* - Bigelow's Monkeyflower. Occasional, sandy washes and moist canyon drainages, 800-1700 m. *J. Evens 27 (GMDRC).*

Mimulus guttatus **DC.** - Common Large Monkeyflower. Infrequent, moist banks of canyon drainages, seeps and springs, 1000-1800 m. *B. Pitzer 3899 (UCR).*

Mimulus parishii **E. Greene** - Parish's Monkeyflower. Rare, known only from wet sandy banks of Bull Creek, upper Bull Canyon, 1800 m. *F. Warrick 80 (GMDRC).*

Mimulus pilosus **(Benth.) S. Watson** - Downy Monkeyflower. Uncommon, streambeds or moist disturbed areas, mainly east side, 1300-1600 m. *J. André 5182 (GMDRC).*

Mimulus rubellus **A. Gray** - Ciliolate-toothed Monkeyflower. Uncommon, sandy slopes and banks of washes, 800-1900 m. *F. Warrick 27 (GMDRC).*

Penstemon eatonii **A. Gray var.** *undosus* **M.E. Jones** - Eaton's Firecracker. Frequent, along rocky washes and slopes, 1300-2100 m. *J. André 3870 (GMDRC).*

Penstemon palmeri **A. Gray var.** *palmeri* - Palmer's Penstemon. Infrequent, gravelly areas along Kelbaker Rd, Granite Pass to Kelso Dunes, 800-1300 m. *J. André 3692 (GMDRC).*

***Penstemon pseudospectabilis* M.E. Jones** - Desert Penstemon. Occasional, among boulders, mostly east side, 1300-1800 m. *J. André 5087 (UCR).* (intergrades with *P. stephensii*).

***Penstemon rostriflorus* Kellogg** - Bridge's Penstemon. Rare, known only from rocky north-facing slope near summit of Silver Peak at 2000 m. *J. André 3821 (GMDRC).*

****Penstemon stephensii* Brandegee** - Stephens' Beardtongue. Rare, among boulders east side of range, 1300-2000 m. *J. Evens 77 (GMDRC).* (intergrades with *P. pseudospectabilisi*).

Solanaceae (Nightshade Family)

***Datura wrightii* Regel** - Jimson Weed. Occasional, in sandy washes and along roadsides, 800-1300 m. J. *André 5708 (GMDRC).*

***Lycium andersonii* A. Gray** - Anderson's Desert-thorn. Frequent, sandy bajadas and moderate slopes, 1000-1900 m. *J. André 3869 (GMDRC).*

***Lycium cooperi* A. Gray** - Cooper's Desert-thorn. Frequent, gravelly bajadas in diverse mixed shrub associations, and slopes below 1600 m. *K. Hart 13 (GMDRC).*

***Nicotiana obtusifolia* Martens & Galeotti** - Desert Tobacco. Occasional, in crevices and cavities in rocks, wash margins, below 1500 m. *J. André 2124 (GMDRC).*

***Physalis crassifolia* Benth.** - Thick-leaved Ground Cherry. Frequent, sandy and rocky places, mostly on west and south side of range, below 1400 m. *G.L. Clifton 25200 (GMDRC).*

***Physalis hederifolia* A. Gray var. *fendleri* (A. Gray) Cronq.** - Ivy-leaved Ground Cherry. Infrequent, margins of washes or among rocks, 900-1900 m. *J. André 4573 (GMDRC).*

Tamaricaceae (Tamarisk Family)

!*Tamarix ramosissima* Ledeb. - Tamarisk. Uncommon, canyon bottoms, springs and seeps, 1000-1600 m. Eradication and control program is ongoing. *B.A. Stein 76 (GMDRC).*

Ulmaceae (Elm Family)

+*Ulmus pumila* L. - Siberian Elm. Uncommon, planted at historic homesteads but has not escaped here (has elsewhere in Mojave Desert). *(obs. J. André 1994).*

Urticaceae (Nettle Family)

***Urtica dioica* L. ssp. *holosericea* (Nutt.) Thorne** - Hoary Nettle. Rare, one location on east side of range, in moist seep under a granitic overhang, 1350 m. *J. Evens 41 (GMDRC).*

Viscaceae (Mistletoe Family)

Arceuthobium divaricatum **Engelm.** - Pinyon Dwarf Mistletoe. Occasional, woodlands on *P. monophylla*, 1400-2100 m. Infrequently collected. *(obs. J. André 1998).*

Phoradendron californicum **Nutt.** - Desert Mistletoe. Frequent on *Acacia* and *Prosopis*, 800-1500 m. *Norris s.n. (GMDRC).*

Phoradendron juniperinum **A. Gray** - Juniper Mistletoe. Scattered throughout range, but infrequent on *Juniperus*, 1200-2100 m. *J. André 3712 (GMDRC).*

Zygophyllaceae (Caltrop Family)

Kallstroemia californica **(S. Watson) Vail** - California Kallstroemia. Rare, sandy areas in washes and on flats, only from southeast side, 1250 m. *J. André 6650 (UCR).*

Larrea tridentata **(Sessé & Moq. Ex DC.) Cov.** - Creosote Bush. Common dominant, sandy or gravelly bajadas or south-facing slopes, 700-1500 m. *B. Pitzer 3965 (UCR).*

!***Tribulus terrestris*** **L.** - Puncture Vine. Rare pernicious weed, along roadways and other disturbed areas, 900-1300 m. *J. André 5944 (GMDRC).*

CLASS II. MONOCOTYLEDONEAE - Monocotyledons

Cyperaceae (Sedge Family)

Carex alma **L. Bailey** - Sturdy Sedge. Occasional, seeps and springs in approximately 40 localities throughout range, 1100-1900 m. *J. André 3445 (GMDCR).*

Eleocharis parishii **Britton** - Parish's Spike-rush. Infrequent, seeps and springs and abandoned livestock improvements, 1000-1800 m. *J. André 3746 (GMDRC).*

Scirpus pungens **Vahl.** - Common Threesquare. Uncommon, seeps and canyon watercourses, Bull and Budweiser Canyons, Coyote Springs, 1200-1700 m. *J. André 4099 (GMDRC).*

Iridaceae (Iris Family)

Sisyrinchium halophilum **E. Greene** - Nevada Blue-eyed Grass. Uncommon, seeps and springs in approximately 10 localities throughout range, 1100-1800 m. *J. Evens 60 (GMDRC).*

Juncaceae (Rush Family)

Juncus bufonius **L. var.** ***bufonius*** - Common Toad Rush. Uncommon, seeps, springs and watercourses, 1200-1700 m. *B.A. Prigge 2863 (UCR).*

Juncus bufonius **L. var.** ***occidentalis*** **F.J. Herm.** - Western Toad Rush. Rare, canyon seep at base of Budweiser Canyon, 1300 m. *J. André 4086 (GMDRC).*

Juncus macrophyllus **Cov.** - Large-leaved Rush. Rare, canyon seep at base of Carr and Budweiser Canyons, 1200 -1400 m. *J. André 4156 (GMDRC).*

Juncus mexicanus **Willd.** - Mexican Rush. Infrequent, seeps and springs and moist canyon bottoms, 1100-1800 m. *J. André 4087 (GMDRC).*

***Juncus nodosus* L.** - Knotted Rush. Rare, known only from Coyote Spring on east side of range, 1200 m. *J. André 4046 (GMDRC).*

***Juncus xiphioides* E. Meyer** - Iris-leaved Rush. Infrequent, seeps and springs in approximately 30 localities throughout range, 1100-1900 m. *J. André 4584 (GMDRC).*

Liliaceae (Lily Family)

***Agave deserti* Engelm.** - Desert Agave. Infrequent, rocky slopes, scattered throughout east side of range, 1200-1700 m. *C.B. Wolf 10183 (RSA).*

***Allium atrorubens* S. Watson var. *cristatum* (S. Watson) D. McNeal** - Dark Red Onion. Rare, only on ridgetops, west side of range, 1800-2000 m. *J. André 4096 (GMDRC).*

Calochortus kennedyi* Porter var. *kennedyi - Kennedy's Mariposa. Occasional, dry slopes and gravelly bajadas on far east side of range, 1100-1400 m. *J. André 3693 (GMDRC).*

***Calochortus kennedyi* Porter var. *munzii* Jepson** - Munz's Red Mariposa. Rare, open flats in Bull Canyon, 1450 m. *B.A. Stein s.n. (UCSC).*

***Dichelostemma capitatum* (Benth.) A.W. Wood ssp. *pauciflorum* (Torrey) Keator** - Desert Blue-dicks. Occasional, gravelly bajadas, east side, 1100-1600 m. *K. Hart 32 (GMDRC).*

***Hesperocallis undulata* A. Gray** - Desert Lily. Uncommon, aeolian sand deposits near Kelso Dunes, 800-900 m. *J. André 4213 (GMDRC).*

***Muilla transmontana* E. Greene** - Great Basin Muilla. Rare, sandy flats, aeolian sand deposits near Kelso Dunes, 800 m. *J. André 3628 (GMDRC).* Note: this is a unique form that a southern disjunct and very small-flowered perhaps warranting further evaluation.

***Yucca baccata* Torrey** - Spanish Bayonet. Frequent, dry rocky slopes and plateaus, mostly in pinyon-juniper woodland, 1300-2100 m. *J. André 3621 (GMDRC).*

+***Yucca brevifolia* Engelm.** - Joshua Tree. Planted as ornamental in Granite Cove (1400 m), no natural populations exist in range. *(obs. J. André 1994).*

***Yucca schidigera* K.E. Ortgies** - Mojave Yucca. Common, gravelly bajadas in diverse mixed scrub, 1000-1800 m. *J. André 5839 (GMDRC).*

***Zigadenus brevibracteatus* (M.E. Jones) H.M. Hall** - Desert Death Camas. Occasional, sandy bajadas, especially on east side of range, 1000-1400 m. *J. André 5061(UCR).*

Poaceae (Grass Family)

***Achnatherum hymenoides* (Roemer & Schultes) Barkworth** - Indian Ricegrass. Infrequent, mainly on aeolian deposits near Kelso Dunes, 800-1000 m. *J. André 4198 (GMDRC).*

***Achnatherum parishii* (Vasey) Barkworth** - Parish's Needlegrass. Uncommon, gravelly or rocky slopes, 1300-2100 m. *J. André 5986 (GMDRC).*

***Achnatherum speciosum* (Trin. & Rupr.) Barkworth** - Desert Needlegrass. Common, rocky slopes, plateaus and gravelly pediments, 1000-2100 m. *C.B. Wolf 10118 (UC).*

!*Agrostis semiverticillata* **(Forsskal) C. Chr.** - European Needlegrass. Uncommon, disturbed or moist areas (Coyote Spring), 1200-1500 m. *J. André 3899 (GMDRC).*

Aristida adscensionis **L.** - Six-weeks Three-awn. Frequent, dry open bajadas and slopes among boulders, 900-1400 m. *J. André 3987 (GMDRC).*

Aristida purpurea **Nutt. var.** *fendleriana* **(Steudel) Vasey** - Fendler Three-awn. Frequent, rocky slopes, crevices, gravelly ridgetops, 1100-2100 m. *J. Evens 90 (GMDRC).*

Aristida purpurea **Nutt. var.** *nealleyi* **(Vasey) K.W. Allred** - Neally Three-awn. Infrequent, dry south-facing slopes, 1000-1600 m. *B.A. Prigge 2349 (RSA).*

Aristida purpurea **Nutt. var.** *parishii* **(A. Hitchc.) K.W. Allred** - Parish Three-awn. Infrequent, gravelly or rocky slopes, 1000-1500 m. *R.F. Thorne 50670 (RSA).*

Aristida ternipes **Cav. var.** *hamulosa* **(Henrard) J.S. Trent** - Hook Three-awn. Rare, dry hills near Budweiser Wash at 1300 m. *B.A. Prigge 2321 (RSA).*

Bothriochloa barbinodis **(Lagasca) Herter** - Cane Bluestem. Uncommon, crevices in rocks, rocky shaded canyon bottoms, 1200-1400 m. *J. André 3756 (GMDRC).*

Bouteloua aristidoides **(Kunth.) Griseb. var.** *aristidoides* - Needle Grama. Frequent, bajadas, flats and gravelly slopes, 800-1700 m. *R.F. Thorne 50627 (RSA).*

Bouteloua barbata **Lagasca var.** *barbata* - **Six-weeks Grama**. Common after summer rains, washes, sandy bajadas, lower slopes, below 1600 m. *B. Pitzer 4006 (UCR).*

!*Bromus diandrus* **Roth** - Ripgut Grass. Uncommon, disturbed areas around historic settlements and livestock structures, mainly west side of range, 1100-1400 m. *B. Pitzer 3917 (UCR).*

!*Bromus hordeaceus* **L.** - Soft Chess. Uncommon, three isolated occurrences in disturbed sites on east side of range, 1200-1400 m. *J. André 3623 (GMDRC).*

!*Bromus madritensis* **L. ssp.** *rubens* **(L.) Husnot** - Foxtail Chess, Red Brome. Common, ubiquitous weed, widespread in all habitats, 700-2100 m. *B.A. Stein 85 (GMDRC).*

!*Bromus tectorum* **L.** - Cheat Grass. Common, ubiquitous weed, widespread in all habitats, 700-2100 m. *J. André 5919 (GMDRC).*

Bromus trinii **Desv.** - Chilean Chess. Uncommon, sandy bajadas or washes, growing in shade of large shrubs, 1200-1700 m. *J André 4908 (UCR).* (mistakenly reported as non-native in Jepson Desert Manual).

!*Cynodon dactylon* **(L.) Pers.** - Crab Grass. Uncommon, moist seeps or subalkaline soils of disturbed areas (Willow Spr. Basin), 1200-1400 m. *J. André 3744 (GMDRC).*

Elymus elymoides **(Raf.) Swezey ssp.** *brevifolius* **(J.G. Smith) Barkworth** - Squirreltail. Uncommon, dry open slopes and ridgetops, 1800-2000 m. *F. Warrick 75 (GMDRC).*

Elymus multisetus **(J.G. Smith) Burtt Davy** - Big Squirreltail. Uncommon, ridgetops and rocky crags, 1800-2150 m. *F. Warrick 74 (GMDRC).*

Elymus trachycaulus **(Link) Shinn. ssp.** *trachycaulus* - Slender Wheatgrass. Uncommon, rocky slopes and canyon walls, Bull Canyon only, 1400-1900 m. *R.F. Thorne 51609 (RSA).*

!*Elytrigia intermedia* **(Host) Nevski ssp.** *intermedia* - Intermediate Wheatgrass. Rare, unconfirmed report by G.L Clifton, 2001.

!*Eragrostis cilianensis* **(All.) Janchen** - Stinkgrass. Infrequent, disturbed soils or in post fire recovery on hillsides, 1200-1800 m. *B. Pitzer 4016 (UCR).*

Erioneuron pulchellum **(Kunth.) Tateoka** - Fluff Grass. Frequent, sandy or gravelly bajadas and pediments, 800-1800 m. *Dorothy Fugle 1045 (UCSB).*

!***Hordeum murinum*** **L. ssp.** ***murinum*** - Wall Barley. Uncommon, disturbed areas along roadsides and buildings in Granite Cove, 1300 m. *J. André 4051 (GMDRC).*

Melica frutescens **Scribner** - Tall Melica. Uncommon, bouldery slopes, pinyon-juniper woodland, 1300-1700 m. *Al Flink s.n. (UCSB).*

Melica imperfecta **Trin.** - Small-flowered Melica. Infrequent, rocky slopes and bouldery areas in pinyon-juniper woodland, 1300-1600 m. *G.L. Clfton 24771 (GMDRC).*

Muhlenbergia asperifolia **(Nees & Meyen) L. Parodi** - Scratchgrass. Rare, in Bull Cyn on moist sandy margins of creekbed, 1100 m. *J. André 3628 (GMDRC).*

Muhlenbergia microsperma **(DC.) Trin.** - Littleseed Muhly. Uncommon, dry slopes and open sites on pediments, Willow Springs Basin, 1100-1200 m. *J. André 3954 (GMDRC).*

Muhlenbergia porteri **Beal.** - Porter's Muhly. Frequent, crevices on cliffs and on steep rocky slopes, 900-1800 m. *S. Boyd 5143 (RSA).*

Muhlenbergia rigens **(Benth.) A. Hitchc.** - Deergrass. Locally common, moist sandy margins of streams, canyon bottoms, 1300-2100 m. *B.A. Prigge 2323 (UCR).*

Phragmites australis **(Cav.) Steudel** - Common Reed. Uncommon, perennial moist sand in canyon bottoms and near seeps, 1300-1800. *J. André 3742 (GMDRC).*

Pleuraphis rigida **Thurber** - Big Galleta. Uncommon, sandy bajadas and aeolian deposits near Kelso Dunes, 700-1300 m. *G.L. Clifton 31216 (GMDRC).*

!***Poa annua*** **L.** - Annual Bluegrass. Rare waif, in moist shady drainage above Coyote Spring, and near developments in Granite Cove, 1200-1400 m. *J. André 5994 (GMDRC).*

Poa bigelovii **Vasey & Scribner** - Bigelow's Bluegrass. Uncommon, slopes among boulders and understory of pinyon woodland, 1300-1600 m. *G.L. Clifton 11821 (GMDRC).*

Poa fendleriana **(Steudel) Vasey ssp.** ***longiligula*** **(Scribner & Williams) R. Soreng** - Longtongue Mutton Grass. Uncommon, rocky north-facing slopes, 1500-2100 m. *G.L. Clifton 24374 (GMDRC).*

Poa secunda **J.S. Presl** ssp. ***secunda*** - One-sided Bluegrass. Frequent, rocky or gravelly slopes and ridgetops, 1000-2100 m. *J. André 3939 (GMDRC).*

!***Polypogon monspeliensis*** **(L.) Desf.** - Annual Beard Grass. Uncommon, moist sandy soils near seeps and springs, 1100-1900 m. *F. Warrick 109 (GMDRC).*

!***Schismus barbatus*** **(L.) Thell.** - Mediterranean Grass. Common, sandy bajadas and flats, disturbed areas, 700-1400 m. *J. André 2099 (GMDRC).*

Sporobolus cryptandrus **(Torrey) A. Gray** - Sand Dropseed. Uncommon, rocky to sandy washes, slopes in pinyon-juniper woodland, 1300-2100 m. *J. André 5933 (GMDRC).*

Tridens muticus **(Torrey) Nash** - Slim Tridens. Uncommon, dry rocky slopes and in pinyon and juniper woodland, 1200-2000 m. *E.W. Lathrop 7804 (UCR).*

!***Vulpia bromoides*** **(L.) S.F. Gray** - Cheat Fescue. Rare waif, mouth of Budweiser Canyon in disturbed soils, 1300 m. *J. Evens 82 (GMDRC).*

Vulpia microstachys **(Nutt.) Munro var.** ***pauciflora*** **(Beal) Lonard & Gould** - Awned Fescue. Uncommon, moist soils (Cottonwood Spring), 1400 m. *G.L. Clifton 26330 (GMDRC).*

!***Vulpia myuros* (L.) C. Gmelin var. *hirsuta* Hack.** - Rattail Fescue. Rare, near Cottonwood Spring, 1400 m. *(obs. R.F. Thorne et. al. 1981).*

Vulpia octoflora* (Walter) Rydb. var. *octoflora - Slender Fescue. Frequent, washes, sandy bajadas and aeolian sands near Kelso Dunes, 700-1800 m. *J. André 4170 (GMDRC).*

Typhaceae (Cattail Family)

***Typha domingensis* Pers.** - Southern Cattail. Uncommon, springs and seeps and moist sandy areas in canyon bottoms, 1100-1700 m. *J. André 5888 (GMDRC).*

HABITAT CORRELATES OF *CALOCHORTUS PLUMMERAE*, A RARE MARIPOSA LILY, ON THE CAMPUS OF CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO

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ABSTRACT: *Calochortus plummerae*, a mariposa lily endemic to southern California, was encountered on the campus of California State University, San Bernardino following the wildfires of October 2003. Transect studies across Badger Hill and Little Badger Hill on the campus were conducted to evaluate the distribution of *C. plummerae* with respect to topographic position, steepness of slope, and density of non-native annual plants. *C. plummerae* occurred most frequently on ridges and least frequently on south-facing slopes. Densities on north-facing slopes and in gullies were intermediate. Density did not vary with steepness of slope, but did vary with density of non-native annuals. Few, if any, *C. plummerae* plants were found where non-native annual plants were abundant.

KEYWORDS: Liliaceae, *Calochortus plummerae*, *Calochortus splendens*, grassland, exotic plants, habitat

INTRODUCTION

Calochortus plummerae E. Greene, Plummer's mariposa lily, is a rare plant endemic to Southern California. It produces a slender, branched flowering stalk, 30-60 cm tall, supporting two to six bell shaped flowers with pink or rose petals banded on the inner face with long yellow hairs (Fiedler and Ness 1993). Its relatively broad basal strap leaves are usually withered at the time of flowering. It grows on a variety of substrates and in a number of plant communities between 100 m and 1700 m elevation (Fiedler and Ness 1993; CNDDB 2006). It generally occurs on dry, rocky, sandy sites, but these range from alluvial soils to granitic rock outcrops (CNDDB 2006). It is found in chaparral, coastal sage scrub, valley and foothill grassland, cismontane woodland, and yellow pine forest (Fiedler and Ness 1993; CNPS 2006). Across this spectrum, however, it is found most frequently in chaparral or coastal scrub (CNDDB 2006). Within these shrub communities, it may occur preferentially in relatively open vegetation. Several reports of *C. plummerae* have noted its association with canopy openings (even grassy openings) in chaparral (CNDDB 2006). Fire may also favor *C. plummerae* in these communities: several occurrences of *C. plummerae* have been reported after fire and increased numbers of *C. plummerae* have been observed in a few populations that have been revisited after fire (CNDDB 2006). Beyond these observations, however, little is known about environmental and ecological factors that influence the distribution and density of *C. plummerae.*

This species is restricted to an area that includes only part of Southern California, and much of its historic range is highly urbanized. It has been found primarily between the Transverse Ranges and the coast in a region that encompasses parts of Riverside County, San Bernardino County, Los Angeles County, Ventura County, and Orange County. The California Native Plant Society includes it in CNPS List 1B.2, indicating that the species is rare throughout its range and is fairly endangered (i.e., 20-80% of the species' occurrences are threatened; CNPS 2006).

In the spring following the massive wildfires of October 2003, a number of populations of *C. plummerae* were found in the San Bernardino National Forest and on adjacent lands. These included a population on the campus of California State University, San Bernardino that had previously escaped detection (Fig. 1). The studies of *C. plummerae* distribution described here were carried out to elucidate factors that might influence distribution and density of *C. plummerae.* Potential associations of *C. plummerae* with topographic position, steepness of slope, and density of non-native annual plants were investigated.

METHODS

The transect studies were carried out on Badger Hill between May 25 and June 7, 2005. Badger Hill, located in San Bernardino, CA (117° 18' E, 34° 11' N) is a ridge of Pelona schist surrounded by recent alluvium (Miller *et al.* 2001). It is approximately one km long and 0.2-0.4 km wide, ranging in elevation from approximately 475 m above sea level at the base to 565 m at the peak. Its soil is classified as a fine sandy loam of the Friant series with rock outcrops (Woodruff and Brock 1980). At the time of this study (seven months after the Old Fire burned the site in October 2003) the most common dominants on Badger Hill were resprouting chamise (*Adenostoma fasciculatum* Hook. & Arn.) and white sage (*Salvia apiana* Jepson).

To evaluate potential associations between *C. plummerae* density and topographic position, steepness of slope, and density of annual plants, we established 16 transects over four topographic positions. Four belt transects were established on ridges, four were established on north-facing slopes, four were established on south-facing slopes, and four were established in gullies. The four nominally north-facing slopes had aspects that ranged in azimuth from 6° west of north to 20° east of north. The four nominally south-facing slopes covered a wider range of aspects, ranging from 65° east of south to 15° west of south. Gullies all faced more north than south (80° east to 15° west of north). The convoluted nature of Badger Hill allowed us to place transects on non-contiguous north-facing and non-contiguous south-facing slopes that descended from the main ridge, two side ridges, and a small hill at the west end of the ridge (Little Badger Hill).

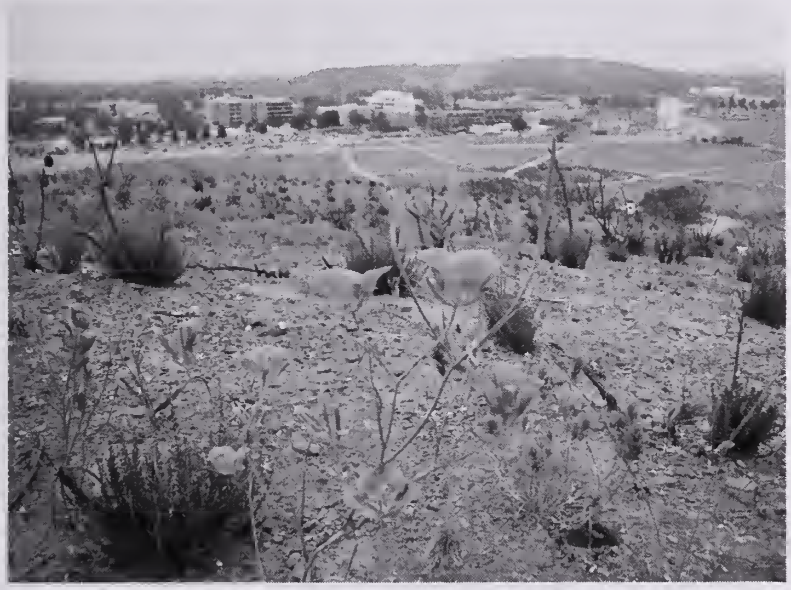

Fig. 1. *Calochortus plummerae* on Little Badger Hill on the campus of California State University, San Bernardino, seven months after the October wildfires of 2003.

The transects varied in length (50 m - 250 m long), generally ending at tops and bottoms of slopes and at the ends of ridges. Transects were usually 6 m wide, but some segments were as narrow as 3 m if the narrow width of the ridge or the need to avoid dirt-bike trails prevented the establishment of a wider transect. Transects were divided into 10-m segments for the purpose of recording data, and the following parameters were recorded in each segment: density of *C. plummerae*, steepness of slope, and density of annual plants. Density of non-native annual plants (hereafter referred to as "weeds" for the sake of brevity) was estimated by individually scoring the density of (1) all annual grasses, (2) *Centaurea melitensis* L. (tocalote or maltese star-thistle), and (3) *Brassica nigra* (L.) Koch (black mustard) as either absent (scored as 0), 1-10 plants m^{-2} (scored as 1), 10-20 plants m^{-2} (scored as 2), or >20 plants m^{-2} (scored as 3). A "total weed score," obtained by summing the scores for all the three classes of annual plants, was used in most of the analyses.

Because most of the *C. plummerae* plants were past flower during the 2004 study, and because *Calochortus splendens* Benth. was present in the area, we conducted additional censuses in the spring of 2005 to ensure that potential errors in species identification had not confounded our results. We recensused the first 50 m of each of the transects on ridges, south-facing slopes, and north-facing slopes between May 20 and May 25, 2005 when both species were in flower. Transects were relocated to within ca. 1-3 m of their original position using a hand-held GPS unit (GPS 12, Garmin International, Olathe, KS).

RESULTS

Transect Studies in 2004

Overall, we counted 2,473 *C. plummerae* plants across the 16 belt transects, which encompassed a total area of 8,454 m^2. *C. splendens* was identified in the area, and efforts were made to exclude this species from the counts. However, in some cases (*e.g.*, where upper stems had been lost to herbivory) species identification was difficult, and a few *C. splendens* may have been included in counts.

There was a significant effect of landscape position on *C. plummerae* density (Kruskal-Wallis one-way ANOVA by ranks, $H = 9.03$, $P < 0.05$) with significantly higher densities on ridges than on south-facing slopes (Nemenyi test, $P < 0.05$). There was no relationship between steepness of slope and *C. plummerae* density within any topographic position (Fig. 2a), and the overall correlation, using data from all 16 transects, was not significant ($R = 0.41$, 14 df, n.s.). Across all 16 transects, *C. plummerae* density decreased as total weed score increased ($R = 0.54$, 14 df, $P < 0.05$, Fig. 2b). However, this relationship was driven largely by the fact that average weed density also differed across topographic positions, with south-facing slopes having higher weed densities than ridges.

Both *Calochortus* density and annual weed density varied along the length of each transect. To better separate effects of landscape position from effects of weeds on *C. plummerae* density, individual 10-m segments of each transect were examined, and areas with similar weed densities in each topographic position were identified. A chi-square goodness-of-fit test was conducted to determine whether *C. plummerae* was randomly distributed across the landscape, comparing the fraction of the censused area that fell into each weed class x topographic position category to the fraction of the *C. plummerae* population found in each category. Due to low sample sizes in the higher weed categories, areas with total weed scores ≥ 3 were combined, yielding four weed classes with total weed scores of 0, 1, 2, and ≥ 3. No areas were encountered on south-facing slopes that had no weeds. Therefore, a partial chi-square of zero was assigned to that category, yielding a conservative goodness-of-fit test.

The observed distribution of *C. plummerae* was significantly different from that expected based on a random distribution ($X^2 = 2836$, 9 df, $P < 0.001$). Density of *C. plummerae* decreased as weed density increased in most topographic positions (Fig. 3). Conversely, for any given weed density, more mariposa lilies were found on ridges and fewer were found on south-facing slopes (Fig. 3). Similar results were obtained for the relationship between *C. plummerae* density and the density of individual classes of weeds (i.e., annual grasses, *Brassica nigra*, and *Centaurea melitensis*). However, since the distributions of some of these weed classes were correlated, it was not possible to separate the effects of individual classes of weeds.

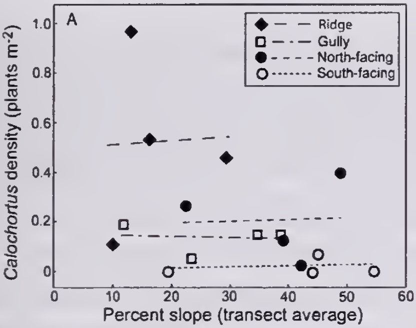

Fig. 2A. Average *Calochortus* density in each of the sixteen transects plotted against average slope for the transect. Individual regression lines for each topographic position are indicated by dashed lines. None was statistically significant.

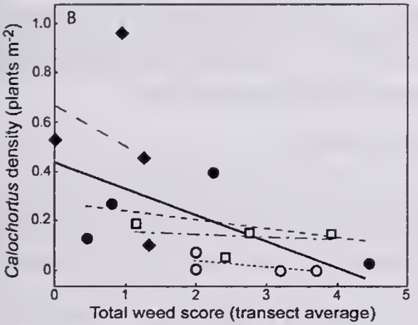

Fig. 2B. Average *Calochortus* density in each of the sixteen transects plotted against average total weed score for the transect. Individual regression lines for each topographic position are indicated by dashed lines. None was statistically significant. The solid line represents the regression line through all 16 points ($P < 0.05$).

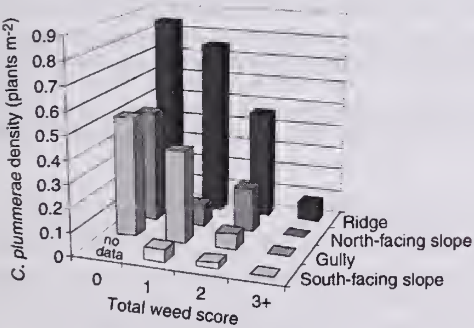

Fig. 3. Average density of *C. plummerae* in all segments of transects that fell into the specified weed classes in the specified topographic positions. "Total weed score" ranged from zero to nine and was the sum of the density scores for the three categories of non-native annual plants (grasses, black mustard, and tocalote).

Transect Studies in 2005

Results from censuses in 2005 confirmed those from 2004. At the time of the 2005 census, both *C. plummerae* and *C. splendens* were in bloom. However, *C. splendens* was going to seed, and *C. plummerae* was just beginning to bloom. Seventy-three percent of the *Calochortus* plants recorded were *C. plummerae. Calochortus plummerae* and *C. splendens* had roughly similar distributions across the 12 transects that were recensused. As in the 2004 census, *C. plummerae* was not distributed evenly across topographic positions (Kruskal-Wallis one-way ANOVA by ranks, $H = 7.65$, $P < 0.05$), and its density on ridges was significantly higher than that on south-facing slopes (Nemenyi test, $P < 0.05$). Similarly, *C. splendens* was not distributed evenly across topographic positions (Kruskal-Wallis one-way ANOVA by ranks, $H = 8.01$, $P < 0.01$), and its density on ridges was also significantly higher than that on south-facing slopes (Nemenyi test, $P < 0.05$).

Both *C. plummerae* density and total *Calochortus* density in 2005 were lower than the densities recorded for presumed *C. plummerae* in 2004. However, this pattern was consistent with falling numbers of flowering *C. plummerae* in three permanent plots established in spring of 2004 and recensused in 2005 (unpublished data).

DISCUSSION

The *Calochortus plummerae* that occurs on the campus of California State University, San Bernardino is most abundant along ridgetops and in areas with low densities of non-native annual plants. Very few plants were found on south-facing slopes during this study and, although the low-lying, alluvial coastal scrub on campus was not formally surveyed, the only mariposa lily observed there was *C. splendens*. The rarity of *C. plummerae* on south-facing slopes and alluvium does not necessarily reflect a general pattern of *C. plummerae* distribution. Populations of *C. plummerae* have frequently been reported to occur on south-facing slopes and on alluvium (CNNDB 2006). Observations of *C. plummerae* on south-facing slopes may partially reflect the relative abundance of south-facing slopes across this species' range: the cis-montane side of the Transverse Ranges, which represents a sizeable portion of *C. plummerae's* range, faces south, resulting in a greater abundance of south-facing slopes than north-facing slopes. More extensive studies of the type reported here would be required to determine whether *C. plummerae* is found less frequently than expected on south-facing slopes across the species' entire range.

The negative relationship we found between annual plant density and *C. plummerae*, in contrast, may reflect a widespread pattern. *Calochortus plummerae* has been found in a variety of plant communities, including grasslands that are dominated by non-native annuals. However, a search of the California Natural Diversity Database in 2006 revealed that, of 72 reports describing habitat for *C. plummerae*, only 1% described it as grassland, an additional 11 % described it as a mosaic of grassland and shrubland, and 82% described it as chaparral or sage scrub (CNDDB 2006). Therefore, although *C. plummerae* is encountered in grassland, these occurrences are relatively rare.

The negative association between *C. plummerae* and non-native annuals suggests that these annuals may interfere with either the growth or establishment of *C. plummerae*. Demonstrating and quantifying the effects of these annuals on *C. plummerae* will require additional, manipulative experiments. Interference by annuals has important implications for the persistence of *C. plummerae* in southern California. Type conversion of chaparral and sage scrub to annual grassland, caused by frequent fires or other types of disturbance, is of increasing concern (*e.g.*, Minnich and Dezzani 1998, Stylinski 1999, Keeley 2001, Cione *et al.* 2002). Populations of *C. plummerae* may not persist in areas that are overrun by non-native annuals as shrublands are converted to grasslands.

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NOTEWORTHY COLLECTION

MIMULUS AURANTIACUS Curtis var. *PARVIFLORUS* (Greene) Thompson. Santa Barbara County: San Miguel Island, Fish Peak. USGS San Miguel Island East Quadrangle. 34° 01' 39"N, 120° 18' 40"W; elevation 179.5 ft. On face of cliff above shore. 29 June 2006. Morgan Ball, John La Bonte (SBBG) Corolla red. Determined by Steve Junak.

Previous knowledge. Mimulus flemingii Munz has been previously reported from San Clemente Island and all of the northern Channel Islands except for San Miguel Island (P. A. Munz. 1974. A Flora of Southern California, p. 811). In the most recent California flora, it was considered part of the normal variation in species (David A. Thompson. 1993. "Mimulus"in Jepson Manuel of Higher Plants, James C. Hickman, ed., p. 1040). Since the Jepson treatment was published, however, Thompson recognizes these island populations as *Mimulus aurantiacus* Curtis var. *parviflorus* (Greene) [Thompson. 2005. Systematics of Mimulus subg. Schizoplaucus (Scrophulariaceae),Systematic Botany Monographs 75: 157]. The red corolla likely favors pollination by Allen's hummingbirds and other species on the islands.

Significance. M. aurantiacus var. *parviflorus* was discovered on a cliff by wildlife biologist Morgan Ball and herpetologist John La Bonte on Fish Peak where they were monitoring pinnipeds for SRS Technologies. It is new to San Miguel Island. It was probably common on the island before extensive sheep ranching devastated the island's ecology. Currently under name of *Mimulus flemingii, M.a.* var. *parviflorus* has a CNPS ranking on List 4.3 (Limited distribution, not very endangered) (CNPS Inventory of Rare and Endangered Vascular Plants of California, 7th edition, http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi).

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NOTEWORTHY OBSERVATION
Peirson's Milk-Vetch: Ovules, Seeds, and Seed Size

ASTRAGALUS MAGDALENAE VAR. PEIRSONII (Munz & McBurney) Barneby. (FABACEAE) – Imperial County, Algodones Dunes; study area in the US Bureau of Land Management (BLM) Gecko Management Area south of California State Route 78; USGS 7.5' Glamis Quadrangle; study area roughly bounded on the north by UTM (NAD83) 11S 3643800N; on the east by 682000E; on the south by 3639500N; and on the west by 676500E; elevation approximately 100 m (330 ft.) MSL.

Background. Astragalus m. var. *peirsonii* (Peirson's milk-vetch) is a Federally listed threatened species [US Fish and Wildlife Service (FWS), October 6, 1998, Federal Register 63:53596-53615] and State listed endangered species restricted to the Algodones Dunes in California. It occurs on windblown slopes and hollows throughout the dunes in varying densities. Most of the suitable habitat is sparsely occupied at a density of less than 100 plants per hectare, but some small areas contain densities >5,000 plants per hectare.

The fruits and seeds of *A. m.* var. *peirsonii* have been described as "pods 2-3.5 cm. long, ovules 11-16, seeds 4.5-5.5 mm. long" (R. C. Barneby 1964, Atlas of North American *Astragalus*, *Memoirs of the New York Botanical Garden* 13:862-863); Bowers provided additional seed measurements of 4-7 mm. long (J. E. Bowers 1996, Seedling emergence on Sonoran Desert dunes, *Journal of Arid Environments* 33:63-72).

As a short-lived perennial, *A. m.* var. *peirsonii* exhibits a dual reproductive strategy adapted to the harsh environment of the Algodones Dunes' highly variable annual rainfall pattern. The timing of fall and winter rains may have a dramatic effect on reproductive success. Well-timed fall precipitation may initiate germination events where new germinants can flower within 2-3 months. These germinants may produce a few pods per plant in their first season. Early-spring drought probably inhibits flowering. A small percentage of plants may survive the hot summer months. Persisting plants often produce copious numbers of pods per plant in their second year. This dual reproductive strategy adds to the complexity of devising a monitoring and management strategy to ensure the long-term survival of this species in a setting of increasing human activity.

Studies have indicated that only a small fraction of a plant's seeds will survive to germinate from the seed bank (J. L. Harper 1981, *Population Biology of Plants*, Academic Press, London; M. Fenner 1985, *Seed Ecology*, Chapman and Hall, London). Once in the seed bank, seeds are subjected to various factors that will determine their fate, such as length of dormancy and rate of recruitment (C.C. Baskin and J.M. Baskin 2001, *Seeds: Ecology, biogeography, and evolution of dormancy and germination*, Academic Press, San Diego). Measures and estimations have been made of the static seed bank (numbers of seeds present at a given time) for *Astragalus m.* var. *peirsonii*. Estimations of input to the seed bank have been based on the anecdotal figures given by Barneby for the numbers of ovules per seed pod noted above. Because research and management actions may be predicated on this factor, we considered that it was vital to examine the premise that all ovules developed into seeds.

Methods. The BLM and FWS have begun to collect baseline data to estimate fecundity as a function of annual seed production, seed bank size, seed bank dynamics, and recruitment. The FWS conducted manipulative field studies in the Algodones Dunes between February and June 2005, under a permit issued by the BLM. The California Dept. of Fish and Game issued a permit allowing us to collect seed pods from *A. m. var. peirsonii* in April 2005, as part of our data-gathering effort. We randomly collected 416 seed pods from 78 plants within the 250-hectare study area. Several maturing pods were collected per plant (mean = 5 pods). Pods were dissected and the number of ovules (immature seeds) and mature seeds counted using a stereoscope. We qualitatively differentiated between ovules and mature seeds by size and shape. Ovules were almost uniformly less than 1 mm in diameter. Seeds are elongated, kidney-shaped ovals and flattened. All measurements were taken on the longest axis. We counted the number of mature seeds per pod, calculated median seed length per pod, and totaled the combined number of ovules and mature seeds per pod. Data were averaged among pods collected from individual plants. We present between-plant averages and standard deviations (SD). We additionally present the coefficient of variance (CV) for seed length within and between pods.

Results. Seed pods contained on average 5.2 mature seeds (n = 78, SD = 2.63, maximum = 15) and 11.41 mature seeds and ovules (n = 78, SD = 2.36, maximum = 17). Seeds were on average 4.98 mm long (n = 73, SD 0.68, maximum = 7.40 mm). Variance in seed length was greater between pods (CV = 15.25) than within pods (average CV = 6.71, n = 85, SD = 4.29).

Discussion. Our results most closely coincide with those observations of Barneby (1964) with regard to the number of ovules per pod and average seed size. Barneby gave no figures for numbers of mature seeds per pod. We believe that our study provides the first data regarding the actual number of mature seeds per pod for this plant. The BLM and FWS are currently formulating a monitoring strategy for *A. m. var. peirsonii.* Some previous studies have simply used the mean number of ovules cited by Barneby (1964) as indicative of the numbers of seeds deposited into the seed bank from a single pod. This more-accurate determination of mature seed production per pod will allow a better estimate of fecundity and seed bank size and a refined metric to better project potential population size. Other factors such as pod, ovule, and seed herbivory and predation should also be taken into account.

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BOOK REVIEW

Checklist of the Vascular Plants of San Diego County (fourth edition) by Jon P. Rebman and Michael G. Simpson, 2006. San Diego Natural History Museum, San Diego, CA. 120 pp. ISBN 0-918969-05-0 $12.95. Book contents are available online at http://www.sdnhm.org/research/botany/sdplants/index.html; printed copies can be obtained from the San Diego Natural History Museum.

Vouchered regional checklists and floras (henceforth *checklists*) are one of the foundations of botany. Taxa are characterized not only by their morphological description, but also by their range. These fundamental data are the raw material for compilations such as *The Jepson Manual.*

The distribution of taxa is often more fascinating than the physical characteristics of the taxa. How can one explain the unusual distributions of many species? Why are some taxa found only in a given area with the nearest population found hundreds of miles away? Why are some taxa common in nearby areas not found in a given area?

It is often said that our knowledge of the distribution of plants rests on voucher specimens. That is ultimately true, but most botanists may be unaware of how many incorrectly-determined vouchers exist. *Many vouchers have not been recently reviewed for correct determination!* Most herbaria rely on experts for a given genus to annotate their collections, but such review happens only infrequently.

The case can be made that our knowledge of the distribution of plants rests on authoritative *checklists.* A checklist for an area provides a list of taxa that the authors certify are found in a given area. As important are the taxa *not* in the list; the authors certify that they have not been able to find any good evidence that those taxa are present in that given area. The expertise of the authors of a checklist is crucial. Taxa known only from a few vouchers are immediately suspicious to experts in the flora of a given area, and the vouchers can be scrutinized to find errors in determination.

San Diego County has been richly supplied with expert checklists. Beauchamp produced his comprehensive *Flora of San Diego County* in 1986. Michael Simpson and coauthors provided the first checklist update of Beauchamp's *Flora* in 1995, with new editions following in 1996 and 2001. Stimulated primarily by over 100 new County records found as part of the San Diego County Plant Atlas Project, Rebman and Simpson have now produced the fourth edition in 2006. Rebman and Simpson have also found a number of misidentified vouchers, and deleted many species found in the previous *Checklist*. The new *Checklist* contains 2,314 total taxa, 73.4% of them native, a net of 167 new taxa. There is a net of 58 new native taxa over the third edition even after deleting over 30 native taxa that were misidentified in the previous county checklist.

This fourth edition adopts many of the recent nomenclatural changes that have resulted from analysis of DNA sequences; much of the Preface is devoted to clearly explaining the changes relative to the *Jepson Manual* nomenclature. Fortunately, for botanists uncomfortable with the new names, the names used in *Beauchamp* or in the *Jepson Manual* are given as synonyms when different, and a new index has been added to help find the current names of old friends. The new edition also has page headers, making it easier to locate a family and genus by flipping through the pages. As in previous editions, symbols identify new additions to the County flora, taxa not found in the *Jepson Manual*, and taxa endemic to San Diego County. A very useful Appendix contains a list of taxa cited in *Beauchamp* or previous *Checklists* but which are not documented with vouchers as occurring in the County. Probable misidentifications of previous vouchers are also noted in that list.

This checklist will be tremendously helpful to botanists working in any part of San Diego County in many ways. Botanists trying to identify taxa in the field can immediately consult this very portable *Checklist* for the possible identifications. Botanists working on floras of subareas of the County can easily learn which taxa have been vouchered. The *Checklist* is especially useful in updating checklists from the past; I used the third edition daily when I was updating Clemons' *Anza-Borrego Desert Checklist* from 1985. It took me only weeks to update Clemons' *Checklist* by using the *County Checklist*; it would otherwise have taken months to go through the vouchers manually to get new names and find out which taxa had currently-accepted vouchers.

It is extremely important to have an up to date *Checklist*, since each edition incorporates new knowledge that is very hard to obtain otherwise. For example, many desert botanists will be surprised that *Ditaxis serrata* does not exist in San Diego County! The commonly-seen species known to many botanists by that name in our desert is actually *Ditaxis neomexicana*. The *Checklist* also reveals that even *D. californica* may just be a glabrous form of *D. neomexicana*. A list of other such interesting sources and a few additional comments on the *Checklist* are given at:
http://tchester.org/plants/analysis/floras/sdc.html

Perhaps the most important aspect of publishing a checklist is to provide a reference for botanists to critically examine for omissions and misidentifications. San Diego County is a huge area with high biological diversity; it takes the work of many people in order to produce a complete and reliable *Checklist*. Previous editions of this *Checklist* have stimulated a number of people to contribute to it; those people are acknowledged in the *Checklist*. It might stimulate more people to contribute new County records if the next edition of the Checklist had a *Target List* appendix listing taxa that are found just outside the county border, but not yet documented to be in the County.

If you work in botany in San Diego County, you need this *Checklist*, and the *Checklist* needs your contribution to make the next edition even better.

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